This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

GOV

Digitized by Google

Digitized by Google

1978

E
S

ulture
RD UNIVERSITY
EB 1979
RTMENT

FIC-

Digitized by Google

Digitized by Google

Y4.Ag8/1:W85

WOOD RESIDUE UTILIZATION ACT OF 1978

95-2

HEARING

BEFORE THE

SUBCOMMITTEE ON FORESTS

OF THE

COMMITTEE ON AGRICULTURE

HOUSE OF REPRESENTATIVES

NINETY-FIFTH CONGRESS

SECOND SESSION

ON

H.R. 13324

AUGUST 8, 1978

Serial No. 95–QQQ

Printed for the use of the Committee on Agriculture

STANFORD UNIVERSITY
FEB 1979
GOVT DOCUMENT DEPARTMENT

U.S. GOVERNMENT PRINTING OFFICE
33-770 O WASHINGTON : 1978

Digitized by Google

COMMITTEE ON AGRICULTURE

THOMAS S. FOLEY, Washington, *Chairman*

W. R. POAGE, Texas, *Vice Chairman*
E DE LA GARZA, Texas
WALTER B. JONES, North Carolina
ED JONES, Tennessee
DAWSON MATHIS, Georgia
GEORGE E. BROWN, Jr., California
DAVID R. BOWEN, Mississippi
CHARLES ROSE, North Carolina
JOHN BRECKINRIDGE, Kentucky
FREDERICK W. RICHMOND, New York
RICHARD NOLAN, Minnesota
JAMES WEAVER, Oregon
ALVIN BALDUS, Wisconsin
JOHN KREBS, California
TOM HARKIN, Iowa
JACK HIGHTOWER, Texas
BERKLEY BEDELL, Iowa
GLENN ENGLISH, Oklahoma
FLOYD J. FITHIAN, Indiana
JOHN W. JENRETTE, Jr., South Carolina
RAY THORNTON, Arkansas
LEON E. PANETTA, California
IKE SKELTON, Missouri
JOSEPH S. AMMERMAN, Pennsylvania
JERRY HUCKABY, Louisiana
DAN GLICKMAN, Kansas
DANIEL K. AKAKA, Hawaii
HAROLD L. VOLKMER, Missouri
CHARLES WHITLEY, North Carolina
TED RISENHOOVER, Oklahoma

WILLIAM C. WAMPLER, Virginia, *Ranking Minority Member*
KEITH G. SEBELIUS, Kansas
PAUL FINDLEY, Illinois
CHARLES THONE, Nebraska
STEVEN D. SYMMS, Idaho
JAMES P. JOHNSON, Colorado
EDWARD R. MADIGAN, Illinois
MARGARET M. HECKLER, Massachusetts
JAMES M. JEFFORDS, Vermont
RICHARD KELLY, Florida
CHARLES E. GRASSLEY, Iowa
TOM HAGEDORN, Minnesota
W. HENSON MOORE, Louisiana
E. THOMAS COLEMAN, Missouri
RON MARLENEE, Montana

PROFESSIONAL STAFF

FOWLER C. WEST, *Staff Director*
ROBERT M. BOR, *Counsel*
HYDE H. MURRAY, *Counsel*
JOHN R. KRAMER, *Special Counsel*
BERNARD BRENNER, *Press Secretary*

SUBCOMMITTEE ON FORESTS

JAMES WEAVER, Oregon, *Chairman*

GEORGE E. BROWN, Jr., California
RAY THORNTON, Arkansas
JOSEPH S. AMMERMAN, Pennsylvania
JERRY HUCKABY, Louisiana
DAVID R. BOWEN, Mississippi
JOHN KREBS, California
IKE SKELTON, Missouri

JAMES P. JOHNSON, Colorado
STEVEN D. SYMMS, Idaho
RICHARD KELLY, Florida

Digitized by Google

CONTENTS

H.R. 13324, a bill to establish pilot projects for testing and demonstrating practical application of existing technology for the utilization of wood residues from timber harvesting, forest protection and management, and the manufacture of wood products ..... Page 2
Report from U.S. Department of Agriculture 2

STATEMENTS

Allison, Gary, president, Wheelabrator Cleanfuel Corp 66
Dose, Joseph C., Chief, Division of Forestry, Bureau of Land Management, Department of the Interior 59
Response to question by Hon. James Weaver 64
Hansen, Douglas C., Director, Air and Hazardous Materials Division, Region 10, Environmental Protection Agency 23
McGrath, Joseph B., National Forest Products Association 83
Pardo, Richard, programs director, American Forestry Association 101
Resler, Rexford A., Associate Chief, Forest Service, U.S. Department of Agriculture 4
Responses to questions submitted to the Forest Service by Hon. James Weaver 20
Ripley, Thomas H., Director, Division of Forestry, Fisheries, and Wildlife Development, Tennessee Valley Authority 48

ADDITIONAL MATERIAL

Bannister, Robert D., National Association of Home Builders, Washington, D.C., letter of August 4, 1978 109
Barnett, Steele, Western Forestry and Conservation Association, Portland, Oreg., letter of August 4, 1978 108
Erickson, Robert W., Society of Wood Science and Technology, Madison, Wis., letter of August 21, 1978 115
Evans, Brock, Sierra Club, Washington, D.C., letter of August 3, 1978 107
Kimball, Thomas L., National Wildlife Federation, Washington, D.C., letter of August 15, 1978 112
Merry Companies, Inc., statement 105
Montgomery, F. F., Associated Oregon Loggers, Inc., Springfield, Oreg., letter of August 15, 1978, to Dr. Weldon Banton, Office of Energy, U.S. Department of Agriculture 110
Rolton, K. S., American Pulpwood Association, Washington, D.C., letter of 1978 113
Will, J. W., International Paper Co., Veneta, Oreg., letter of September 8, August 21, 1978 117

STATEMENTS SUBMITTED AT TOWN MEETING, MEDFORD, OREG., AUGUST 25, 1978

Bradley, Eleanor, Oregon Environmental Council 124
Enoch, Ronnie, Grants Pass, Oreg 118
Forest Education and Energy Institute 126
Hough, Meryln, Oregon State Department of Environmental Quality 123
Irby, Jim, Eagle Point, Oreg 118
Newbry, Lynn, Medford Corp., Medford, Oreg 119
Shaw, Bruce, Medford, Oreg 130
Simmonds, Larry, Medford, Oreg 134
Smith, Donald, forest supervisor, Rogue River National Forest 137
Smith, John L., Industrial Forestry Association, Portland, Oreg 120

3 474SU XL 1630
10/98 31150-168 NULE

Digitized by Google

STATEMENTS SUBMITTED AT TOWN MEETING, EUGENE, OREG., AUGUST 29, 1978

	Page
Adkinson, Verner J., director, Lane Regional Air Pollution Authority	184
Alcock, John E., supervisor, Willamette National Forest	146
Associated Oregon Industries	187
Bureau of Land Management, Oregon State Office, Department of the Interior	141
Burwell, Dave, Leaburg, Oreg	212
Clark, Virgil, director, Lane County, Oreg., Forestry Program	177
Devere, Martin, North West Timber Association	194
Fowler, Jim, Bio-Solar, Research and Development	190
Franklin, Jerry F., Chief Plant Ecologist, Pacific Northwest Forest and Rangeland Experiment Station, Forest Service, U.S. Department of Agriculture	151
Freeburn, Scott A., Oregon State Department of Environment Quality	167
Gruber, Gerald J., Eugene district forester, Industrial Forestry Association	193
Hart, David R., general manager, Wheelabrator Cleanfuel Corporation, Albany, Oreg	198
Lang, Jim, Reaction Products, Inc., Springfield, Oreg	196
Lawler, Thomas A., forester, Bohemia Inc., Eugene, Oreg	213
Lynn, John M., president, Fisher Stoves International, Eugene, Oreg	185
MCRCO, Inc. (The McKenzie River Cooperative)	204
Norwood, Bill, director, Physical Plant, University of Oregon	179
Pratt, Camilla, commissioner, Eugene Water and Electric Board	184
Riccio, Joseph, Oregon State Department of Geology	168
Rust, Jerry, chairman, Lane County, Oregon, County Commissioners	176
Skill, Neil, director, Oregon State Forestry Act	173
Starry, Kenneth L., Coquille, Oreg	214
Weaver, Hon. James, a Representative in Congress from the State of Oregon	140
Worthington, Richard E., Regional Forester, Pacific Northwest Region, Forest Service, U.S. Department of Agriculture	161

Digitized by Google

WOOD RESIDUE UTILIZATION ACT OF 1978

TUESDAY, AUGUST 8, 1978

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON FORESTS OF THE
COMMITTEE ON AGRICULTURE,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10 a.m., in room 1302, Longworth House Office Building, Hon. James Weaver (chairman of the subcommittee) presiding.

Present: Representatives Johnson and Symms.

Staff present: Peggy L. Pecore, clerk; Phyllis Rock and Rita De Simone.

Mr. WEAVER. The Subcommittee on Forests will be in session.

We are here to hold a hearing on H.R. 13324—to establish pilot projects for testing and demonstrating practical application of existing technology for the utilization of wood residues from timber harvesting, forest protection and management, and the manufacture of wood products.

The Nation appears to be heading toward scarcities in two areas that come together in this bill.

One is a wood supply that is expected to fall short of our demands before the end of the century.

The other is a diminishing supply of fossil fuels, especially oil and gas, relative to our need for them.

A large share of the wood volume on commercial forests remains in the woods in the form of slash from logging operations, or in the form of dead or diseased but salvageable wood.

Some of this is still useful for wood products. Some is useful for distillation into low grade gas and fuel oil. And much of the rest is burnable in some form for the generation of electricity.

Here and there around the country some use is being made of these wood residues. In the case of those resulting from manufacturing processes, utilization is much further ahead. This hearing is designed to bring out information and examples of utilization of wood from the forest and the mill.

The bill itself will permit the U.S. Forest Service to enter into contracts and agreements to demonstrate how existing technology can be used to improve use of wood wastes.

[The bill H.R. 13324 and the report from the Department of Agriculture follow:]

Digitized by Google

[H.R. 13324, 95th Cong., 2d sess.]

A BILL To establish pilot projects for testing and demonstrating practical application of existing technology for the utilization of wood residues from timber harvesting, forest protection and management, and the manufacture of wood products

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Wood Residue Utilization Act of 1978".

SEC. 2. (a) To (1) increase the utilization of wood residues resulting from timber harvesting, forest protection and management, and the manufacture of wood products, including wood pulp; (2) develop alternative sources of energy; (3) reduce the hazard of forest wildfires; (4) reduce the adverse effects on air quality of burning wood residues; and (5) assist in meeting growing demands for wood products; the Secretary of Agriculture (hereinafter referred to as the "Secretary") may establish pilot projects to develop and to test and demonstrate practical application of existing technology for the utilization of wood residues, including the transportation and sorting of such residues.

(b) Pilot projects may be established under this Act in conjunction with projects, contracts, or agreements entered into under any other authority which the Secretary may possess.

(c) Pilot projects established under this Act shall not infringe upon the slash disposal provisions of existing contracts for the sale of national forest timber except by mutual agreement of the parties to such contracts.

SEC. 3. (a) To implement the purposes of this Act, the Secretary is authorized, without regard to section 3709 of the Revised Statutes, as amended (41 U.S.C. 5); to (1) enter into contracts, cooperative agreements, and other arrangements; (2) provide technical, financial, and related assistance to Federal, State, and other governmental agencies, public or private institutions, universities, and organizations, business entities, and individuals in the United States; and (3) sell or otherwise dispose of wood residues.

(b) The Secretary shall issue such regulations as he deems necessary to implement the provisions of this Act.

SEC. 4. (a) To carry out the purposes of this Act, there is hereby established in the Treasury of the United States a special fund into which there shall be deposited at the end of each of five fiscal years beginning with the fiscal year ending September 30, 1979, $15,000,000 from National Forest Fund receipts not otherwise appropriated. Such sums are hereby authorized to be appropriated in amounts as may be specified in annual appropriations Acts and shall remain available until expended.

(b) Deposits made pursuant to the Act of August 11, 1916, as amended (39 Stat. 462, as amended; 16 U.S.C. 490) may be used to supplement moneys appropriated under this section

(c) Funds appropriated under the authority of this Act shall be available until expended.

SEC. 5. The Secretary shall make brief annual reports to the House Committee on Agriculture and to the Senate Committee on Agriculture, Nutrition, and Forestry on the accomplishments of the pilot projects authorized by this Act. The first such report shall be submitted at the time of submission of the annual fiscal budget, after the first full year of implementation of this Act.

SEC. 6. This Act shall become effective October 1, 1979.

DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D.C., September 7, 1978.

Hon. THOMAS S. FOLEY,
Chairman, Committee on Agriculture, House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: As you requested, here is our report on H.R. 13832, a bill "To establish pilot projects for testing and demonstrating practical application of technology for the utilization of wood residues from timber harvesting, forest protection and management, and the manufacture of wood products."

The Department of Agriculture recommends that H.R. 13832 be enacted.

H.R. 13832 would authorize the Secretary of Agriculture to conduct a five-year program to increase wood residue utilization on public and private forest lands.

Digitized by Google

The program's objective would be to carry out pilot projects that test or demonstrate practical application of wood residue utilization technology. These pilot projects could be in conjunction with other activities taking place on forest land under other authorities of the Secretary, including contracts for the sale of timber from the National Forests. Pilot projects could be carried out within the Department or through cooperative arrangements with other government agencies, universities, business entities, or individuals. Non-government cooperators would contribute at least 50 percent of the cost of manufacturing or processing facilities installed as a part of the pilot projects.

The bill authorizes $7,500,000 for each year of the five-year program which would begin October 1, 1979. Funds appropriated could supplement funds provided under other laws, including cooperative deposits for brush disposal made by National Forest timber purchasers under the Act of August 11, 1916 (39 Stat. 462, as amended; 16 U.S.C. 490). Funds would remain available until expended. The Secretary would be required to submit annual reports to Congress on the accomplishments of the pilot projects. These reports would be submitted with the reports required by section 8(c) of the Forest and Rangeland Renewable Resources Planning Act of 1974 (90 Stat. 2949, as amended; 16 U.S.C. 1600).

Forest Service Associate Chief Rex Resler testified in support of H.R. 13324, the predecessor to this bill, before the Subcommittee on Forests, August 8, 1978. While recommending enactment, Mr. Resler offered a number of amendments. We are pleased the Subcommittee accepted all of these recommendations and chose to include them in H.R. 13832. We recommend no other substantive amendments.

We estimate the cost of the program for the five years authorized by the bill to be $7.5 million annually. Personnel requirements are estimated to be 10 person-years by the third year of the program.

The Office of Management and Budget advises that there is no objection to the presentation of this report from the standpoint of the Administration's program.

Sincerely,

BOB BERGLAND, *Secretary.*

USDA SUPPLEMENT STATEMENT—H.R. 13832

OPPORTUNITIES FOR WOOD RESIDUE UTILIZATION

H.R. 13832 would provide the opportunity to test and demonstrate under field conditions new and promising means to utilize the large volumes of usable wood residues remaining following forestry activities and wood manufacture. The benefits of such utilization would extend beyond the removal of the residue, however. The overall, long-term management of the forest would be strengthened by removal of a fire, insect and disease hazard, by improving accessibility for equipment needed to reforest the area, and by lessening the visual impacts created by the residue accumulations.

The use of wood residues, including material resulting from forest management operations, as a fuel to generate energy is being tested in several projects throughout the Nation. Harvesting residues are being directly burned to generate power in Burlington, Vermont. A recently initiated project in northern California will use logging slash from a National Forest to supplement geothermal steam to generate power. New products are being developed that use residues and low-value timber previously unused. Structural flakeboard, a building panel composed entirely of wood residues, is an example of new use. New machinery to harvest and process residues is being developed. The existence of this technology creates an opportunity to initiate pilot projects and demonstrations that adapt the research information to practical conditions, perfect processes, and provide needed economic evaluation.

In addition to projects linked directly to current research technology, there are opportunities to conduct independent projects. For example, the installation of concentration yards where residues from several timber sale areas and different ownerships are collected, sorted and further distributed to appropriate markets or directly processed could be established. Market development in areas where none now exist could be undertaken. Examinations could be made of existing harvesting equipment to determine what modifications would be necessary to handle residues or smaller material and move the materials from the forest to processing facilities.

Digitized by Google

RECOMMENDED AMENDMENTS

We recommend one technical amendment. On line 21, page 3 of the bill change "(6 U.S.C. 1600)" to "(16 U.S.C. 1600)."

BUDGET AND PERSONNEL REQUIREMENTS

We estimate a program cost of $7.5 million for each year of the five-year program.

Most of the additional personnel required to carry out the pilot projects would be provided by cooperators and contractors receiving funds under this program. We estimate that the Department would require about 10 person-years to manage the program by the third year.

Mr. WEAVER. In addition to the witnesses we will hear today, the record will be kept open for 30 days for submission of written statements. I ask unanimous consent that written statements submitted to the committee record, subject to the discretion of the chairman, shall be accepted into the official committtee record of this hearing.

Without objections, it is so ordered.

The first witness is Mr. Rex Resler, Associate Chief of the Forest Service.

STATEMENT OF REXFORD A. RESLER, ASSOCIATE CHIEF, FOREST SERVICE, U.S. DEPARTMENT OF AGRICULTURE

Mr. RESLER. Thank you, Mr. Chairman. I would like to take this opportunity, first off, Mr. Chairman, to thank you and the subcommittee for the attention you have been giving to forestry matters in the recent past and especially with the new legislation for research and cooperative forestry and extension. I think those are major contributions to our arsenal of authorities to do a better job of forestry in this country.

The Department of Agriculture welcomes the opportunity to testify in support of a program to establish pilot projects to improve wood utilization along the lines of that proposed in H.R. 13324. We concur with the chairman and recognize the opportunities and need to improve the utilization of the large volumes of unused wood residues remaining in the forests or available at wood processing facilities. We believe attention to this underutilized resource is needed because of its potential for increasing timber supplies, for reducing the hazard to remaining or new forests from destructive fires and insect and disease infestations, to facilitate regeneration, to encourage thinning of overstocked stands, to lessen the need to dispose of the wood residues by burning and finally, for developing alternative sources of energy.

The Forest Service has been working toward closer timber utilization and H.R. 13324 can provide an important boost for this effort. Close timber utilization involves the development of new technology through research, the transfer of this technology to loggers and wood processors, and the modification of timber sale and harvesting procedures on the National Forests. An example program is the yarding of unmerchantable material to make it more available for use. We will describe some research and related projects already underway later in this statement.

H.R. 13324 would be an important building block in meeting the Department of Agriculture's goals for energy self-sufficiency. On

Digitized by Google

July 26, Secretary Bergland testified on USDA energy goals before the Subcommittee on Rural Development of the Senate Committee on Agriculture. These goals include development and application of alternative sources of energy. Quantitative targets in agriculture and forestry for the year 1990 include net energy self-sufficiency in forest production and processing under conditions that sustain productivity. Fuels from biomass, which includes residues from logging, promise the largest contribution by far toward achieving net self-sufficiency.

The bill would permit the Secretary to carry out a 5-year program of wood residue utilization. Pilot projects established by this program would apply current research technology through tests and demonstrations of processes and procedures. The bill provides for the application of existing technology. We believe narrow interpretation of the term "existing technology" would unnecessarily restrict the scope of project activity. We therefore recommend deletion of the word "existing" in the title and page 2, line 6.

Pilot projects would be initiated with private contractors, including those involved in active timber sales on the national forests, and with other private or public agencies. Project areas could involve all categories of ownership, thus permitting a national forest timber sale to be integrated with sales on nearby private land for the purposes of residue utilization. So that we may have complete flexibility in setting up projects, we suggest the Secretary be given clear authority to use the resources and manpower of the Department as well as private and other public cooperators. We have provided the committee with a proposed amendment to clarify this authority.

The Brush Disposal Act of 1916 allows the Secretary to require purchasers of national forest timber to make deposits into a special fund. Upon completion of harvesting, slash resulting from logging is disposed of either onsite or offsite. The question of slash utilization is of increasing concern to us, particularly in the Pacific Northwest where the harvest of old-growth timber creates large volumes of unutilized material. The customary manner of treating this material is by broadcast burning and piling and burning. Recent air quality standards in these States place some restrictions on the use of these methods, requiring greater consideration of offsite disposal and utilization methods.

To insure the sustained management of the forest and provide for future harvests of timber, some form of treatment must be done.

We emphasize that the Brush Disposal Act permits treatment of only the slash resulting from specific sales. H.R. 13324 would permit a coordinated approach, integrating the treatment of current, as well as past logging slash, with the utilization of other residues. We believe this bill would directly complement the Brush Disposal Act.

H.R. 13324 proposes that the program be financed by depositing $15 million of national forest receipts each year for 5 years into a special fund. We do not recommend the establishment of a special fund. Rather, we recommend that appropriations be made from the general fund through annual appropriations acts. We recommend that the annual authorization ceiling be $7.5 million. Sums appropriated under this authority to be in addition to those provided under other provisions of the law and to remain available until expended.

Digitized by Google

Further, we recommend that the bill provide that non-Federal cooperators would share equally with the Federal Government in the cost of constructing manufacturing facilities used in conjunction with pilot projections. This requirement would apply only to the facility construction and would not be applicable to other project activities such as transportation of residues to concentration yards. We have provided the committee the specific language of these proposed amendments.

The bill requires an annual report to appropriate congressional committees on the pilot projects to be submitted with the budget. While we agree with the need to keep the committees fully informed on the progress of the pilot projects, we feel that an appropriate reporting procedure is already provided for in the Resources Planning Act.

Section 8(c) of that act calls for an annual report on agency programs. We recommend a technical amendment to more closely tie reporting requirements of the bill to the reporting requirements of the Resources Planning Act. We have provided the committee with this and several other technical or clarifying amendments.

This concludes our specific comments on the provisions of H.R. 13324.

However, I would like to mention several of the research activities and trial programs that would greatly benefit from a program of pilot projects. These involve offsite utilization of wood residues.

For instance, there is the structural flakeboard which is made from forest residues and which has been recently developed by the Forest Service research. This product can be used for sheathing and subflooring as an alternate to plywood or lumber.

An efficient burner fueled with green chips, bark, and foliage has been developed at the Southern Forest Experiment Station to provide heat for lumber dry kilns.

The shaping lathe headrig, a machinery innovation which permits use of small, otherwise low value and unused trees, including roots, has been developed to make a variety of products.

Comply, a process for using virtually all of the log to make framing lumber and panel products, has been developed by our Forest Service research. This new process is in contrast with other processes now in use that only utilize about half of the log.

By the way, Mr. Chairman, we, in cooperation with others, developed a demonstration house in Atlanta, Ga. It was open a couple of months ago. It was made exclusively of a Comply product with new design as well. It has an intriguing potential in the future to increase the availability of sheathing, studs, joists, and all kinds of structural members in housing.

The State of California has announced it will build a powerplant in the northern part of the State that will use wood residues in association with geothermal steam. The residues will come from both mills and public forests in the area.

Energy from wood is a current topic of interest. Several successful demonstrations of producing power from wood wastes can be cited. Burlington, Vt., for example, is generating power commercially from wood residues originating from timber harvests in nearby forests. Trees killed by disease in the St. Paul-Minneapolis area are being used in the demonstration to generate power. The results of these proj-

Digitized by Google

ects can be helpful in considering projects in other areas having similar needs and available wood residues.

Specific studies of new methods and procedures for wood utilization can be tied to research technology. A concentration yard, for example, could be established where the wood from several areas and ownerships would be assembled, sorted, processed, or further distributed to appropriate markets. The movement of certain forms of wood residues from the woods to the processing facility may be limited by the capability of present harvesting equipment. Such equipment needs to be modified to accommodate logging slash, such as tree tops or branches.

An important component of any of the various pilot projects must be the development of economic data necessary to justify operation on a commercial basis. We would expect to develop such data in each of the pilot programs.

In summary, Mr. Chairman, we believe there are many opportunities to initiate the program called for in H.R. 13324. The pilot project approach, limited to a specified period of 5 years, can provide the means to move more rapidly to solve the problems and capture the potential benefits related to the utilization of wood residues. We recommend the enactment of H.R. 13324, if amended, as suggested in our testimony.

[The following was submitted:]

Digitized by Google

H.R. 13324
U.S. DEPARTMENT OF AGRICULTURE'S
RECOMMENDED AMENDMENTS

1. Delete the word "existing" from the title and on line 6, page 2.

   Limiting the technology to be tested and demonstrated to that which is existing unnecessarily limits the scope of the program. We agree that the program's emphasis should be demonstration and use of existing technology; however, it may be appropriate on certain projects to develop new technology.

2. Add the words "and other wood residues" after the word "pulp" on line 8, page 1. (Delete the word "and" on line 7, page 1.)

   The bill is unclear as to whether such material as salvable dead trees and rough and rotten trees could be cut and utilized under this program since they do not result from the activities listed in section 2(a)(1). This amendment would insure that projects could be established to utilize this material. It is estimated that there is nearly 88 billion cubic feet of such material in the Nation's forests, much of which could be utilized.

3. Add the following after the word "authorized" on line 17, page 2:

   "in addition to utilizing the manpower and other resources of the Department and"

   This amendment would permit the Secretary to use the resources of the Department, when appropriate, to carry out pilot projects. The emphasis would remain on using private and other public cooperators and contractors.

4. Amend section 3(a) by adding the following language following the word "residues" on line 24, page 2:

   "Provided, however, That projects established under this Act shall provide that non-Federal cooperators must contribute at least 50 percentum of the cost of the plant facilities for the pilot project."

5. Revise section 4(a) as follows:

   "SEC. 4. (a) There is hereby authorized to be appropriated annually for the five fiscal years beginning with fiscal year 1980 the sum of $7,500,000. Such sums shall be in addition to those provided under other provisions of law and shall remain available until expended."

Digitized by Google

6. Revise section 4(b) To read as follows:

"(b) Appropriations provided under this Act may be used to supplement the deposits made pursuant to the Act of August 11, 1916, as amended (39 Stat. 462, as amended; 16 U.S.C. 490)."

The Act of August 11, 1916, pertaining to brush disposal, creates a special fund into which purchasers of National Forest timber make deposits. These deposits are used to treat the logging slash created by the harvesting operation to reduce fire hazard. The work to be done is described in a brush disposal plan made a part of the sale agreements. The funds can be used only on the sale area from which they were collected to treat the slash created by the Sale. This amendment would more accurately describe the relationship between the brush disposal act and this bill.

7. Delete section 4(c). This section duplicates language on lines 9 and 10 of section 4(a).

8. Revise section 5 as follows:

"SEC. 5. The Secretary shall make brief annual reports to the Congress on the accomplishment of the pilot projects authorized by this act. The report shall be submitted with the reports required in section 8(c) of the Forest and Rangeland Renewable Resources Planning Act of 1974 (90 Stat. 2949, as amended; 16 U.S.C. 1600)."

We recommend that the reporting of activities under this act be included with the annual evaluation reports required by the Resources Planning Act rather than submitted separately.

9. Delete section 6.

This section duplicates the implementation schedule set forth in section 4(a).

Digitized by Google

Mr. RESLER. Mr. Chairman, I will presume to show the committee a few examples of this research, if I may.

First off, one of the problems in logging technology is the availability of a lightweight, relatively low-cost cable yarding system that might have the capability also with a grappler to be able to pick up slash in addition to logs.

We have a machine which we call "Pee Wee Yarder" which was developed in the Pacific Northwest by our forest engineering research units.

This Pee Wee Yarder is in the test stage now and shows a substantial potential for being able to remove residues. It is really designed to handle small logs and its application appears to be great in such things as thinning and/or the removal of small materials, like logs and trees, from relatively small stands.

I have a series of pictures here that you have seen many times as you fly over the Pacific Northwest and throughout the Rocky Mountains chain which show the tremendous losses we are suffering from various beetles. All of this could be removed or substantial portions could be removed, without taking into account any exceptions to the sustained yield policy. These are specifically excluded from that consideration by the National Forest Management Act.

We have another interesting development that is in the pilot stage or testing stage now. It is a tracklaying shipper, and it has a capacity to walk through small stands and literally eat trees and slash and turn them back into, through a conveyor belt, another transport that will hold the chips itself. It looks quite promising and would be very useful in the South, particularly on flat grounds. It would remove the forest residues which now must be treated in site preparation work.

I mentioned the house in Atlanta which was built completely of this product [Comply], which is basically just a chip material with two pieces of veneer on both sides. It is used for joists and in addition, we have this structural flakeboard which has exterior and interior application. It could be competitive and is competitive for sheathing and flooring of various types.

There are some other examples of even hardwood where you can take low-grade material and make a useful product that has the capacity for surface veneer work.

Here [indicating] is a stud section mockup. It shows two pieces of very low-grade wood which have been cut off or sliced off at about a quarter of an inch or slightly thicker, and glued together. In this case it is attached to a piece of hardwood of stud size material but the combination could apply just as well to a Comply product.

The point is that there is a wider degree of opportunities to develop useful products and we would visualize in our efforts under this piece of legislation to try to develop that mix of products that would generate both the maximum economy and the use of materials. We think there are great potentials for this and we are very pleased with this legislative proposal.

Mr. WEAVER. I think some exciting things are being done. I compliment you and I want to compliment you on your fine testimony, Mr. Resler.

I want to say, first of all, that I think that the amendments that the Forest Service is recommending strengthen the bill. I accept all of them.

Digitized by Google

Perhaps the only exception that I might make is this. That deals with the amount of funding of the $7.5 million. On the other hand, with the cooperative arrangement and the fact that what we want to do is to provide the seeds here to get private enterprise, we want to make sure that the links of the chain are all fitted together so some small businessman can go in on any of the links and know that the rest of the links are there to continue his business. What we want to do is just get that started. I think the $7.5 million will be sufficient, and therefore I think your recommendations will actually strengthen the bill, and I certainly accept them.

I note in your testimony a very intriguing statement that you hope to see by the year 1990 net energy self-sufficiency in forest production and processing. I think that is a tremendous goal and one that will help us measurably in solving our energy problem in this country.

I have several questions. These have to do with the general situation. I am particularly excited by my own utility, the Eugene Water and Electric Board, planning something that the State of California is going to do in northern California and that is combine geothermal warm water and boost it to steam with slash to produce electricity. It is very exciting.

I wanted to ask you this. Under this bill that we have before us—and I am going to assume it has been amended in the way that you have recommended—could the Forest Service allow, for example, the Eugene Water and Electric Board to put a small generating facility on Forest Service land? The idea is to actually put a small 2 or 5 megawatt boiler plant up in the forest, and I wonder if the authority in the bill, or other authority, would allow you to allow them to do that on your land?

Mr. RESLER. Mr. Weaver, I think we would have adequate authorities to accommodate that kind of a use. However, it would depend on the permanence of the facility. Under those circumstances, we would favor a location not on Federal lands if that situation were possible. But I think this legislation would not need to accommodate that. There are other existing authorities which could be used.

Mr. WEAVER. That is the only thing I wanted to get into, that is, whether you had the authority to do that. We can deal with whether we want to or not at another time.

Mr. RESLER. I understand.

Mr. WEAVER. I am going to be holding hearings in Oregon, and I want to go into this in technical detail there, but I wanted to know right now what the policy is of the Forest Service on slash sales. I want you to describe how you first make a sale of timber where the purchaser goes in and cuts out the timber, brings it out, and leaves some residue on the land. Would you pick up the steps that occur from there on in?

Mr. RESLER. In a conventional sale, the operator would be required only to remove the merchantable portions and whatever of the unmerchantable categories or remaining residues for which there was a ready market. It would still leave substantial volume, particularly in old growth stands.

We are requiring, as you know, in most cases the pulling of unutilized material into a landing in order to avoid the necessity for broadcast burning the entire area. Once those residues are collected

Digitized by Google

then there are a number of ways within existing authorities that we can resell them to another party.

There is also some opportunities under this legislation where we could combine the present sales authority to allow the operator, the purchaser of the original sale, to take on that kind of a removal of the residues into some kind of collection yard or whatever the configuration of use might be.

We could use both those systems, either resale or work out an arrangement that would defray some of the costs by the original purchaser.

Mr. WEAVER. You have a disposal fund now where the purchaser pays into that?

Mr. RESLER. Yes.

Mr. WEAVER. Who actually then is responsible for the brush disposal, the purchaser or the Forest Service?

Mr. RESLER. When we collect the moneys, then we handle the disposal of the brush.

Mr. WEAVER. This is one of the problems that I have been told about. There apparently are some young operators who would like to be independent businessmen. They would like to go in and get this residue out. However, the original purchaser says that he does not want them in there. What can be done about this?

Mr. RESLER. I think there is enough forest residue out there, Mr. Chairman, so that we could accommodate a substantial amount of resale or selling of the forest residues without impacting the original purchaser.

In the event that that was not possible, there are some ways that we could change the contract to be able to delete portions of it, essentially as soon as the operator completes his responsibility and we could make them available more quickly.

Mr. WEAVER. Would this require change of regulation?

Mr. RESLER. No. It would require maybe a change of contract. That is not a major problem.

The principal trouble that we have is that there is some overlapping of responsibilities for fire and other things, but those are manageable.

Mr. WEAVER. Very good.

I have a number of questions, by the way, but I will submit them to you for answer in writing for incorporation into the record. [See p. 20.]

I would like you to comment if you could on any general knowledge you might have about the nutrient loss if we take everything out of the forest. Are we going to run into a problem there?

Mr. RESLER. Mr. Chairman, we are very much concerned about that question. In fact, I have a substantial research effort now looking at the whole nutrient recycling system and trying to make a judgment as to whether or not there would be any measurable, or at least unacceptable, effects on complete utilization.

However, I think it needs to be understood that the bulk of the nutrient from a tree actually comes from the tops, leaves, and the root system rather than the logs themselves.

So, I think it would be safe to say that the risks are very low, that is that there would be any loss of nutrient. I don't think so. We would

Digitized by Google

propose to continue the research on nutrient recycling and make appropriate adjustments to avoid any adverse effects.

Mr. WEAVER. I have a circle chart here which is said to be from the Stanford Research Institute in 1976 with total for forestry residue distribution in the United States.

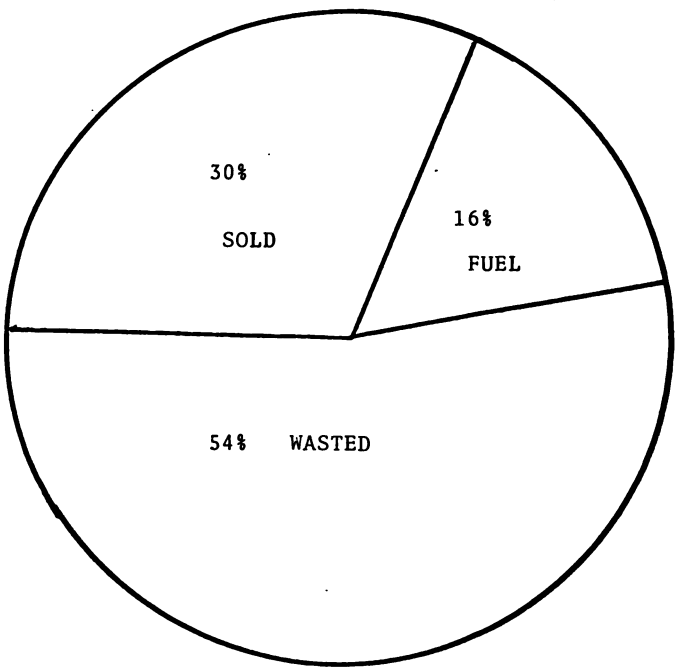
Without objection, I will insert his chart and its attachments into the record at this point.

[The material referred to above follows:]

33-770 O - 78 - 2

Digitized by Google

TOTAL FORESTRY RESIDUE
DISPOSITION
in the UNITED STATES



124.6 Million tons - dry weight

Stanford Research Institute June 1976

Digitized by Google

REGIONAL DISTRIBUTION OF FOREST RESIDUES FROM HARVESTING OPERATIONS

Regions	1970[1] Growing Stock Residues	1973[2] Growing Stock Residues	1973 Nongrowing Stock Residues: Over 4 inches	1973 Nongrowing Stock Residues: 1 to 4 inches	Uncut Trees Over 1 inch In diameter	Total Residues	Bark
	Vol.-Million cu. ft.		Millions of tons, ovendry basis				
Pacific Coast	526	8	10[3]	4	4	26	4.4
Rocky Mountain	103	2	1[4]	1	2	6	1.2
South	683	11	7[4]	16	18	52	9.5
North	283	4	2[4]	9	11	26	4.9
Total	1,595	25	20[4]	30	35	110	20.0

U.S. Forest Service. 1973 The Outlook for Timber in the United States. USDA Forest Res. Rpt. No 20, 367 pp

Ellis, T. H. 1975 The role of wood residue in the national energy picture Proceedings of the Forest Products Research Society meeting on Wood Residue as an Energy Source, Denver, September 1975

Nongrowing stock residues on Pacific Coast in 1970 was approximately 8.8 million tons (587 million cubic feet at 30 pounds per cubic foot). Lumber production in the California redwood region and in the Coast region was up 20 percent in 1973 as compared to 1970. Plywood production was up 7 percent. Log exports increased 15 percent. Weighting these by 1970 roundwood consumption, roundwood harvest should have increased approximately 17 percent. Assuming nongrowing stock residues increased the same percent, then 1973 nongrowing stock residues over 4 inches should have been approximately 10 million tons.

Distribution of nongrowing stock residues over 4 inches in diameter to Rocky Mountain, South, and North is assumed to be proportional to 1973 growing stock residue.

Digitized by Google

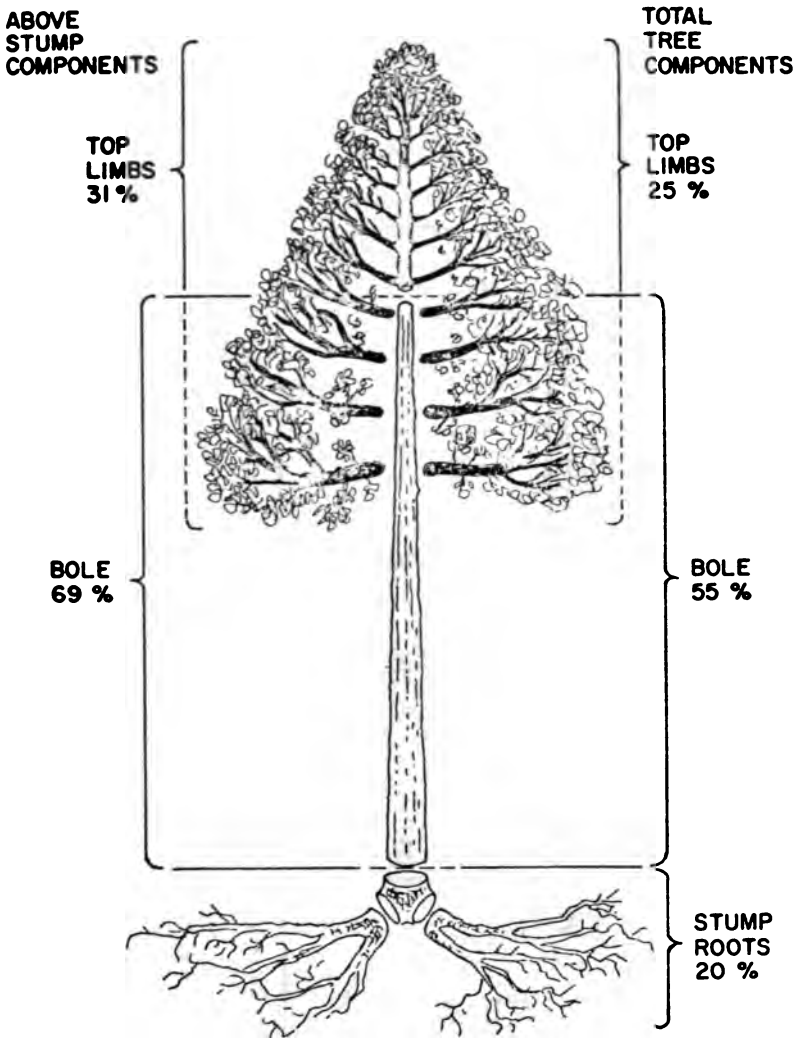
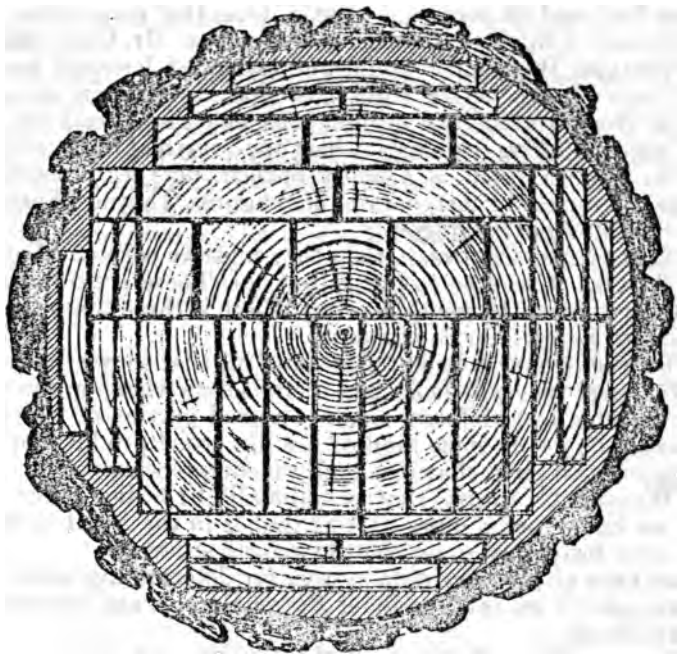


Figure 3.14 - Component proportions of fresh weight of complete trees and shrubs.

Digitized by Google



Bark
Coarse Residues
Sawdust
Planer Shavings
Finished Lumber

FIGURE 2-2

CROSS SECTION OF A SMALL LOG SHOWING SOME SOURCES OF WOOD RESIDUE IN LUMBER MANUFACTURE

Digitized by Google

Mr. WEAVER. It says 30 percent of the pie is sold, and 16 percent is used for fuel, and 54 percent is wasted. Does that make sense to you?

Mr. RESLER. I think that would be quite close, Mr. Chairman.

Mr. WEAVER. How much would you estimate? I should put it this way. I have figures saying right now that we burn in the national forest in Oregon alone, 6.6 million tons of either broadcast or yum yarded material. This is enough to heat one-fourth of the buildings and homes in Oregon. That is actually burned, not just wasted. I just wondered if you could corroborate those figures. They are Forest Service figures that I got in Oregon.

Mr. RESLER. Mr. Chairman, then they must be correct. [Laughter.]

Mr. WEAVER. I wanted to bring that out. There are 6 million tons now that we obviously could be using. There is three times that much, according to Forest Service estimates.

Mr. RESLER. I have a figure in front of me that shows that based on the 1976 forest survey it looks like there is somewhere on the order of 91 billion cubic feet of forest residues a good portion of which might conceivably be put to some kind of use like wood products or energy. That figure is so large that it is really incomprehensible.

Mr. WEAVER. Of course, that is nationally 91 billion cubic feet. Of course we know that a large part of that is in the Northwest, as you said in your testimony, under the old growth situation.

Do we have an effective data system for determining what is going to waste now? I am talking about Forest Service and private land—industrial lands.

Mr. RESLER. First off, let me say that our research program includes about $7 million annually in various aspects of wood utilization. This includes some survey work. We do believe that there is a need for a general study of various regions of the country to identify exactly where this biomass is located and to be able to describe its location and size and potential uses so that we can do a better job of planning for some economic conversion of these residues. This is one of the undertakings we would want to strengthen and we plan to do so.

In addition, the Department of Energy, of course, has a biomass unit which is being established. I understand it is in the Pacific Northwest. We have a cooperative agreement being worked out with them. We would like to be a consultant and contractor with the Department of Energy to do certain kinds of work in the biomass that relates to forest products. I think we can expand our efforts in the general area of identifying where this material is and what use we can make of it.

Mr. WEAVER. Have you tried any nonburning alternative so far and have you made any cost comparisons? Let me ask you first how much it costs on an average. I realize it varies tremendously. I am talking about an average to yard slash and put it into piles and then burn it. Are there any general figures that you have now?

Mr. RESLER. I could provide those for the record. It would take an analysis of individual sales operations.

We have not done a great deal in terms of developing pilot projects. We have tried to encourage more complete utilization, but it must be understood that when the pulp market, particularly in the export trade, is good, we get these piles of slash moved out very readily. Then when the market drops, we find ourselves with tremendous piles of

Digitized by Google

slash scattered around over the national forests, and we have to burn them in place or encourage people to come up and cut them for home use or whatever.

Mr. WEAVER. That may be happening right now with 27 mills on strike in the Northwest and the West.

I appreciate your endorsement of the bill, and I appreciate your testimony. I think your suggestions will strengthen the bill, and we will push for them. I may even introduce a new bill.

Mr. RESLER. Thank you.

[The following was submitted to the subcommittee:]

Digitized by Google

RESPONSE TO WRITTEN QUESTIONS ASKED BY CHAIRMAN
SUBCOMMITTEE ON FORESTS, HOUSE COMMITTEE ON AGRICULTURE
ON H.R. 13324

I.

Q. What effect does the method of sale have on utilization? What are the advantages and disadvantages of Forest Service methods?

A. Assuming that method of sale refers to scaled and tree measurement sales, we believe that the latter encourages better utilization because the stumpage is paid for lump sum whether the material is removed or not. This is based on observation only; we have no definitive studies on which to base this view.

II.

Q. How much does it cost the Forest Service to burn slash, per acre, in the Pacific Northwest?

A. Costs vary by type of slash treatment, as follows:

--Straight broadcast burning (slash burned in place) approximately $300 per acre.

--Broadcast burning on areas on which YUM (yarding of unmerchantable material) is performed, approximately $200 per acre.

--Yarding of unmerchantable material ranges from $300 to $600 per acre. On sales logged by skyline methods, this could be $1,000 or more per acre. Sales logged by helicopter could have YUM costs of up to $2,000 per acre.

--Hand piling and burning, approximately $1,000 to $1,500 per acre.

--Tractor pile and burn, approximately $150 per acre. (Ponderosa pine subregion).

III.

Q. Is burning the best way to clear land of logging residues?

A. Generally speaking, burning is the most efficient and economical way to reduce logging residues. However, burning should not be done in areas with erodible soils or where smoke pollution is a problem. In the latter case, it is possible to use YUM to remove the heavy fuels and then burn the lighter fuels when the potential for smoke pollution is minimized (usually spring and summer).

Digitized by Google

IV.

Q. What nonburning alternatives has the Forest Service tried? What has been the results and the comparative costs?

A. YUM is the most notable alternative. It either replaces broadcast burning or is done in conjunction with burning to remove larger fuels. About half of the sale areas in the Douglas-fir subregion receive YUM treatment. About half of this area is then broadcast burned.

Chemical treatments to hasten decay have been tried but have not been shown to be practical. Burying of slash, at a cost of $1,000 or more per acre have also been tried, primarily in roadside areas, but is not considered an acceptable method. Chipping on-site has been tried but thus far has proven to be too expensive to be practical ($1,000-$2,000 per acre).

V.

Q. Several Forest Service studies have identified numerous public benefits from wood residue use (better use, additional employment, less broadcast burning). Are you able to assign a value to these benefits when evaluating alternatives?

A. We have not attempted to quantify these benefits. It is possible that improved access could be reflected in reforestation contracts. In general, the consideration of alternatives to slash burning is based on environmental factors rather than economic factors.

VI.

Q. What changes have taken place in minimum size of a merchantable log in the past 10 years?

A. In the Pacific Northwest, Forest Service timber sale contract specifications on minimum top diameters of logs were changed about five years ago from 8 inches to 6 inches, except for lodgepole pine which is 5 inches. In some cases, such as thinnings, the minimum top diameter is 4 inches. In the eastern forests, this minimum is generally 4 inches. These utilization standards can vary by species. Our objective is to require the removal of all material in the tree for which there is a current market. Forest industry has responded well to these changes, improving the efficiency of milling equipment to handle smaller logs.

Digitized by Google

Mr. WEAVER. The Chair will now call Mr. Douglas Hansen, Director of the Air and Hazardous Materials Division, U.S. Environmental Protection Agency.

Thank you very much for coming, Mr. Hansen, please proceed.

Mr. HANSEN. Thank you, Mr. Chairman. I have three gentlemen with me. Mr. Bill Burch from our headquarters here, the Air Office, Phil Ross from the Office of Legislation, and Dr. Ben Mason who is the senior research scientist for Geomet, Inc., in case we get into questions.

[The prepared statement and attachments thereto submitted by Mr. Hansen follow:]

Digitized by Google

STATEMENT OF
DOUGLAS C. HANSEN
DIRECTOR OF THE AIR AND HAZARDOUS
MATERIALS DIVISION, REGION 10
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SUBCOMMITTEE ON FORESTS
COMMITTEE ON AGRICULTURE
U.S. HOUSE OF REPRESENTATIVES
AUGUST 8, 1978

Good morning, Mr. Chairman and members of the Subcommittee. I am Douglas C. Hansen. I am Director of the Air and Hazardous Materials Division for Region 10 of the U.S. Environmental Protection Agency. Region 10 is headquartered in Seattle, Washington, and includes the states of Oregon, Idaho, Washington, and Alaska.

I appreciate the opportunity to appear before you today to discuss the effects of prescribed forestry burning upon air quality and alternatives to such burning. In response to your request, I will also discuss a study recently completed for EPA entitled, "Impact of Forestry Burning Upon Air Quality: A State-of-the-Knowledge Characterization in Washington and Oregon." As you know, the question of what to do with wood residue holds special importance for the region of the country in which I live - the Pacific Northwest.

Digitized by Google

Prescribed forestry burning is the application of fire to natural fuels (such as currently unmerchantable wood and tree remnants) under conditions of weather, fuel moisture, soil moisture, etc., that will allow confinement of the fire to a predetermined area and at the same time will produce the intensity of heat and rate of spread required to accomplish one or more objectives. Some purposes of prescribed burning are: to reduce the possibility of wildfire, to remove slash and logging residues, to prepare forest seedbeds, to control understory species, to enhance grazing, to improve wildlife habitat, and to control tree disease. However, in many instances, the sole objective is residue removal. For ease of reference, future mention of slash burning refers to all types of prescribed forestry burning.

The legislation introduced by Chairman Weaver seeks development of productive uses for the wood residues resulting from timber harvesting, forest protection and management, and the manufacture of wood products. The West is presently converting virgin timber stands to managed forests. The residue of clearcutting, a practice used to encourage re-establishment of desirable species, includes huge amounts of cull logs, limbs, tops, foliage, and brush. Slash burning is used to prepare the site for the next

Digitized by Google

crop by removing the flash fuels and fuel concentrations and killing brush which would compete with young trees. Such removal of flash fuels and fuel concentrations is desirable from the standpoint of fire prevention, site preparation, and wildlife and range management.

Although slash burning is a relatively inexpensive tool used in forestry management, it produces effects on the environment, especially air quality. Slash burning and other forms of prescribed burning emit potentially harmful substances. Poor mixing during slash burning between fuel and air and the quenching of combustion by surrounding gases cause incomplete combustion which contributes to the formation of particulates, gaseous organic compounds, and carbon monoxide. Particulate emissions consist of both aerosols and solid matter. Emissions include those gaseous products of combustion and pyrolysis. Pollutants produced include: polycyclic organic matter (POM) or poly-nuclear hydrocarbons and other hydrocarbons, nitrogen oxides, and may include trace metals such as nickel, chromium, berylium, cadmium, and copper.

Smoke particles and other emissions from any forest fire whether planned or accidental can have an adverse impact on the air quality of both adjacent and remote areas.

Digitized by Google

Preliminary studies by several air pollution control agencies in the Pacific Northwest have concluded that slash burning contributes to the Total Suspended Particulates (TSP) non-attainment problem in certain areas. Slash burning may also cause TSP concentrations in excess of the National Ambient Air Quality Standards (NAAQS); however, under current smoke management plans, this would occur in areas where little or no air quality monitoring is performed. Therefore, there is an increasing interest on the part of state and local air pollution control agencies and forest managers in the impact of slash burning upon air quality. Such agencies may find the need to address slash burning in their implementation plans to attain and maintain the NAAQS.

Reduction in visibility due to smoke particles emitted from slash burning is a concern in the Pacific Northwest. The visibility in pristine, forest areas may be impaired through the use of smoke management which seeks to prevent emissions from impinging on populated areas. Emissions are directed toward areas of no or low population. Section 169A of the Clean Air Act which Congress added in 1977 sets a new national visibility goal. The goal is to remedy existing and prevent future impairment of visibility in the mandatory

Digitized by Google

Class I areas. Class I areas generally include (1) international parks, (2) national wilderness areas, (3) national memorial parks and (4) national parks. The Clean Air Act provided for both automatic designations based on stated size requirements and redesignation of other areas at a later date. Forest smoke management plans as previously discussed have the potential to conflict with this goal of visibility as the emissions from slash burning are often directed toward areas protected by Section 169A. EPA, under the Clean Air Act, is now studying factors involved in the implementation of this national goal. Federal managers of Class I areas are cooperating in this effort.

Let me briefly mention two other considerations related to wood waste removal and utilization.

EPA proposed "Criteria for Classification of Solid Waste Disposal Facilities", which are being developed under section 4004 of the Resource Conservation and Recovery Act of 1976, are designed to minimize the adverse environmental effects of the disposal of solid waste and encourage conservation through recycling of solid waste. Consistent with these goals and other environmental considerations, EPA supports research into the utilization of forest residues and other wood wastes for either energy recovery or production of salable products.

Digitized by Google

Water quality can be improved by the removal of residue resulting from logging operations. The methods of removal that are developed under this Act must be consistent with Best Management Practices being developed by local, state and federal agencies under the water quality management planning process prescribed by section 208 of the Clean Water Act.

I hope this summary has offered you some insight into this very complex subject. This leads me into the GEOMET study which I referred to earlier. Let me first give you some background on the need for the study.

In December, 1970, Congress required that national ambient air quality standards be established and that these standards be met nationwide by July of 1975. To ensure attainment and maintanence of these standards, each state was required to develop a State Implementation Plan (SIP) and outline the needed actions. In the 1977 Clean Air Act Amendments, Congress, for areas where standards were not yet being met, required each state to revise its SIP so as to attain the standards by July, 1982. To so revise, each state must be aware of the sources which are causing or contributing to the non-attainment problem and the degree of the contribution.

Digitized by Google

Although stationary industrial source and automobile emissions have been reduced, a number of locations in Oregon and Washington have failed to attain the national ambient standards for total suspended particulates (TSP) and photochemical oxidants (O_X). Forestry burning activities are a major source of particulates and hydrocarbons (a precursor to O_X) emissions. This study was necessary to better determine the impact of forestry burning emissions on ambient air quality and their possible contribution to non-attainment problems.

Responding to this need for information for SIP planning, both the Oregon Department of Environmental Quality (DEQ) and the Washington Department of Ecology (DOE) requested that EPA undertake a comprehensive study of forestry burning in the Pacific Northwest. EPA agreed to lead such a study and held additional meetings with Washington DOE, Oregon DEQ, the Washington Department of Natural Resources (DNR), the Oregon State Department of Forestry (OSDF), and the U.S. Forest Service (USFS) to establish a steering committee to be composed of the above organizations, which would define the study objectives and develop a study outline.

One goal was a document that established the actual and potential air quality impact of forestry burning on forest lands within Washington and Oregon. The document was to:

33-770 O - 78 - 3

Digitized by Google

(1) evaluate past, present, and expected future impact of forestry burning on ambient air quality; (2) identify alternative methods of or alternatives to forestry burning which could reduce the impact on air quality and evaluate the technical and economic feasibility and effectiveness of each; and (3) draw appropriate conclusions on possible short range and long range actions for minimizing the impact of forestry burning on air quality. The document would be the technical basis for evaluating the interaction between current and alternative future forestry burning practices and air pollution control strategies for attain-ment and maintenance of ambient standards. Additionally, it would also establish baseline information for describing the magnitude and impact of existing and projected future emissions resulting from forestry burning.

I will now briefly summarize the GEOMET report, which is currently in final draft form and due for completion very soon. I am accompanied today by Dr. Benjamin Mason, Senior Research Scientist from GEOMET, Inc., who will assist me in responding to any questions you may have concerning the report.

As I stated before, the report characterizes forestry burning in the states of Washington and Oregon and represents the results of literature search and field interviews. The report includes estimates of emissions and

Digitized by Google

air quality impact. Methods of reducing the impact of forestry burning on air quality are explored and research strategies are suggested.

In Washington and Oregon much waste wood or fuel is consumed in slash burning activities. For example, in the 3 year period of 1975 through 1977, an average of 138,000 acres were burned annually on the west side of the Cascade Mountains, consuming an estimated 5.1 million tons of fuel. Indications are that the use of slash burning will continue to increase because of the need to remove residues.

Of the 138,000 acres burned annually, 61 percent of the burning occurred on National Forest lands. The report attributes the relatively high burning rate on National Forest lands in comparison to other forest lands to the fact that a large component of the residue is from decadent old growth material. The old growth stands have an average age of 260 years compared to an average age of 140 years on private lands. These older stands contain more currently unmerchantable material; thus, there are more residues.

Emissions from forestry burning are highly complex and consist of hundreds of gaseous chemical compounds and particulates which vary greatly in physical properties and size. Emission amounts and proportions vary according to fire behavior and fuel conditions. The chemical compounds

Digitized by Google

of certain photochemically reactive emissions change with the length of time they are present in the atmosphere. Emission factors have been studied through laboratory activities and field measurements. Certain unavoidable differences occur and must be considered when interpreting laboratory and field observations. The following ranges for emissions were suggested by leading experts to be the best general estimate of expected normal field emissions presently available:

Carbon dioxide (CO_2)	2000 - 3500 lb/ton of fuel
Water (H_2O)	500 - 1500 lb/ton of fuel
Carbon monoxide (CO)	20 - 500 lb/ton of fuel
Particulates (TSP)	17 - 67 lb/ton of fuel
Hydrocarbons (HC)	10 - 40 lb/ton of fuel

These emission ranges apply only to slash fires, which typically consume dry, dead fuels under conditions which minimize emissions. The values would be much greater for wildfires which consume both live and dead fuels and involve considerable smoldering.

Estimates of total emissions from forestry burning are uncertain. Tables 1 and 2 represent estimates for Oregon and Washington which allow for the uncertainty of available fuel estimates.

Digitized by Google

In both states, air quality problems exist in many urban areas relative to primary and secondary National Ambient Air Quality Standards (See Table 3). Forestry burning is one potential source of pollution which may contribute to exceedances of the NAAQS in populated areas (shown in Table 4). The actual impact of forestry burning depends upon the emissions composition of the plume and how the initial plume characteristics, the meteorology and the terrain affect the transport, dispersion, deposition, and transformation of the plume. The impact can be estimated by airflow models or statistical correlations of pollution measurements made in urban areas with burning activities. No such models were indicated in the report which were specifically designed for the impact of slash burning on the smoke-sensitive regions of the Pacific Northwest; however, models developed for other regions are being tested for use in Oregon and Washington.

Successful venting through smoke management programs may reduce the impact of forestry burning on air quality in certain areas. Both Washington and Oregon have smoke management programs designed to limit the air quality impact of forestry burning activities on the Designated Areas identified in the Smoke Management Plans. The success of smoke management depends on accurate meteorological data in

Digitized by Google

order that a proper decision can be reached to determine the amount and time of burning.

Alternative burning techniques and alternatives to burning exist which could be utilized to reduce impacts on air quality. The major alternatives are shown in Table 5. Those listed under "Improved Harvesting Systems" and "Utilization" all provide increased availability of useable wood fiber and reduced emissions by removing a portion of the available fuel.

Present harvesting systems generate much more logging residues than can be currently utilized. Harvesting systems, which employ maximum utilization techniques, would result in a reduction of harvesting residues. Such systems offering improvement include: directional felling, multi-stage logging, minimum bucking, whole-tree yarding, optimal material handling techniques, and optimal timber contracts. In order to be viable alternatives, improved harvesting systems must provide an economic incentive along with technical feasibility for increased slash utilization.

Increased slash utilization can reduce the need for future slash treatment. Total tree utilization standards outside of the Pacific Northwest have been shown to reduce wildfire potential to a level requiring no further fuel modifications. Generally, slash utilization would have little adverse effect on soils, vegetation or wildlife.

Digitized by Google

Increased use of slash material is dependent on the capability and efficiency of forest industries to process low-grade fiber that may contain undesirable species, rot, defects, rock, and dirt. Present processes cannot efficiently utilize materials with diameters of less than 4 inches.

Slash utilization depends upon the availability and application of pre-processing and transportation systems that can efficiently handle this material.

Various methods of pre-processing are available that allow early conversion of low-grade slash material into uniformly sized chip material to promote increased efficiency of processing and transportation. These methods include: merchandising centers, chip and saw mills, chipping plants, hammermill plants and portable machines for pellet production, and stockpiling of slash or chips for future use.

One major obstacle to slash and chip utilization is the lack of an efficient means of transportation. New and modified hauling systems which may be available to increase the efficieny of slash handling include: short truck and trailer, chip vans, and sideboard modifications.

The question then arises as to the use to which the increased slash material should be put. Many forest product industries can accomodate or be modified to efficiently use

Digitized by Google

slash material. The basic properties of slash material are not significantly different from the fiber used in any wood product. Increasing use of mill residues demonstrates the existing potential for utilizing slash type materials. Sound fiber may be used as fuel for steam to generate electrical power. Slash materials may also be used for other products such as pulp and paper, particle and flakeboard, pelletized material, methane, and synthetic crude oil. Many of these potential uses are presently in the research and development stage. Tables 6 and 7 show the types of wood products presently available or being developed that could utilize slash fiber material.

The economic desirability of increased harvesting and utilization of slash materials may depend on the following factors:

- the availability of less expensive mill residues or other raw materials
- the increasing value of residue wood products
- more efficient slash handling and transportation systems
- the increased demand for residue wood products
- the increasing cost of traditional energy sources

Digitized by Google

The report demonstrated that a major information gap exists as relates to the impacts on air quality of forestry burning. Additional air quality study is needed; however, preliminary studies indicate that the contribution of forestry burning to air quality problems may be quite significant.

In summary, the development of alternatives to slash burning and methods for efficient slash utilization are indeed desirable. Emphasis should be placed on the development of alternatives which are consistent with all environmental, energy, and economic considerations.

The economics and general feasibility of alternative uses for wood wastes have not been demonstrated adequately at the present. There is a need for further consideration of the environmental problems associated with slash burning as well as additional study of alternatives to burning.

Evaluation of the feasibility of alternatives to forestry burning which utilize forest residues for products and energy must include full consideration of all environmental factors. In addition to air quality, these factors relate to water quality, solid waste, herbicides, and pesticides. Any pilot program must fully

Digitized by Google

examine and evaluate the effects on the environment of the residue removal and processes necessitated by alternative uses.

EPA would welcome this type of pilot program which could lead to new products and new energy sources which are environmentally sound and make use of what would otherwise be disposed of in a less desirable manner.

This concludes my prepared statement. I would be happy to respond to any questions you may have.

(The attachments follow.)

Digitized by Google

TABLE 1. ESTIMATED EMISSIONS DUE TO FORESTRY BURNING, 1977 (annual average) IN WASHINGTON
(in tons of pollutant)

County	Estimated Tons of Fuel Burned	Carbon Monoxide		Particulate		Hydrocarbon		Nitrogen Oxides	
		Low	High	Low	High	Low	High	Low	High
WASHINGTON:									
Callam	95,940	959	23,985	815	3,214	480	1,919	96	288
Clark	700	7	175	6	23	4	14	1	2
Cowlitz	111,040	1,110	27,760	944	3,720	555	2,221	111	333
Grays Harbor	104,930	1,049	26,233	892	3,515	525	2,099	105	315
Island	0	0	0	0	0	0	0	0	0
Jefferson	80,460	805	20,115	684	2,695	402	1,609	80	241
King	21,950	220	5,488	187	735	110	439	22	66
Kitsap	2,490	25	623	21	83	12	50	2	7
Lewis	301,230	3,012	75,308	2,560	10,091	1,506	6,025	301	904
Mason	84,440	844	21,110	718	2,829	422	1,689	84	253
Pacific	71,455	115	17,864	607	2,394	357	1,429	71	214
Pierce	25,520	255	6,380	217	855	128	510	26	77
San Juan	0	0	0	0	0	0	0	0	0
Skagit	63,400	634	15,850	539	2,124	317	1,268	63	190
Skamonia	363,510	3,635	90,878	3,090	12,178	1,818	7,270	363	1,091
Snohomish	45,120	451	11,280	384	1,512	226	902	45	135
Thurston	5,440	54	1,360	46	182	27	109	5	16
Wahkiakum	4,150	42	1,038	35	139	21	83	4	12
Whatcom	41,580	416	10,395	353	1,393	208	832	42	125
Combined Western Counties	1,423,350	14,234	355,838	12,098	47,682	7,117	28,467	1,423	4,270
Combined Eastern Counties*	1,227,260	12,273	306,815	10,432	41,113	6,136	24,545	1,227	3,682
Statewide Total*	2,650,610	26,507	662,653	22,530	88,795	13,253	53,012	2,650	7,952

Not including burning by U.S. Forest Service in the Colville and Umatilla National Forests of eastern Washington.

Source: GEOMET, Incorporated

Digitized by Google

TABLE 2. ESTIMATED EMISSIONS DUE TO FORESTRY BURNING, 1977 (annual average) IN OREGON
(in tons of pollutant)

County	Estimated Tons of Fuel Burned	Carbon Monoxide		Particulate		Hydrocarbon		Nitrogen Oxides	
		Low	High	Low	High	Low	High	Low	High
OREGON:									
Benton	5,002	50	1,251	43	168	25	100	5	15
Clackamas	199,684	1,997	49,921	1,697	6,689	998	3,994	200	599
Clatsop	14,855	149	3,714	126	498	74	297	15	45
Columbia	4,748	48	1,187	40	159	24	95	5	14
Coos	137,725	1,377	34,431	1,171	4,614	689	2,755	138	413
Curry	141,753	1,418	35,438	1,205	4,749	709	2,835	142	425
Douglas	888,965	8,890	222,241	7,556	29,780	4,445	17,779	889	2,667
Hood River	45,472	455	11,368	387	1,523	227	909	45	136
Jackson	448,012	4,480	112,005	3,808	15,009	2,240	8,960	448	1,344
Josephine	132,551	1,326	33,138	1,127	4,440	663	2,651	133	398
Lane	761,692	7,617	190,423	6,474	25,517	3,808	15,234	762	2,285
Lincoln	98,021	980	24,505	833	3,284	490	1,960	98	294
Linn	261,745	2,617	65,436	2,225	8,768	1,309	5,235	262	785
Marion	96,367	964	24,092	819	3,228	482	1,927	96	289
Multnomah	44,713	447	11,178	380	1,498	224	894	45	134
Polk	12,409	124	3,102	105	416	62	248	12	37
Tillamook	42,470	425	10,618	361	1,423	212	849	42	127
Washington	3,915	39	979	33	131	20	78	4	12
Yamhill	21,845	219	5,461	186	732	109	437	22	66
Combined Western Counties	3,361,944	33,619	840,486	28,577	112,625	16,810	67,239	3,362	10,086
Combined Eastern Counties	192,592	1,926	48,148	1,637	6,452	963	3,852	193	578
Statewide Total	3,554,536	35,545	888,634	30,214	119,077	17,773	71,091	3,555	10,664

Source: GEOMET, Incorporated

Digitized by Google

TABLE 3. NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Primary Standards	Secondary Standards
Total suspended particulate	Annual geometric mean of 75 $\mu g/m^3$ not to be exceeded	Annual geometric mean of 60 $\mu g/m^3$ not to be exceeded
	24-hour concentration of 260 $\mu g/m^3$ not to be exceeded more than once per year	24-hour concentration of 150 $\mu g/m^3$ not to be exceeded more than once per year
Sulfur dioxide	Annual arithmetic mean of 80 $\mu g/m^3$ not to be exceeded	3-hour concentration of 1300 $\mu g/m^3$ not to be exceeded more than once per year
	24-hour concentration of 365 $\mu g/m^3$ not to be exceeded more than once per year	
Carbon monoxide	1-hour concentration of 40 mg/m^3 not to be exceeded more than once per year	
	8-hour concentration of 10 $\mu g/m^3$ not to be exceeded more than once per year	
Photochemical oxidants	1-hour concentration of 160 $\mu g/m^3$ not to be exceeded more than once per year	
Nitrogen dioxide	Annual arithmetic mean of 100 $\mu g/m^3$ not to be exceeded	

Source: GEOMET, Incorporated

Digitized by Google

TABLE 4. NAAQS ATTAINMENT STATUS FOR OREGON AND WASHINGTON
(X indicates attainment not reached at current time)

Area	Total Suspended Particulate		Sulfur Dioxide		Photochemical Oxidants	Carbon Monoxide *	Nitrogen Dioxide *
	Primary	Secondary	Primary	Secondary			
Oregon							
Portland - Vancouver AQMA ** (Oregon portion)		X			X	X	
Medford-Ashland AQMA **		X			X	X	
Eugene-Springfield AQMA **	X				X	X	
Salem					X	X	
Remainder of State							
Washington							
Seattle ***	X				X	X	
Renton		X					
Kent		X					
Tacoma ***	X		X				
Port Angeles ***		X					
Longview		X					
Vancouver	X				X		
Yakima	X					X	
Tri-cities (Paso, Kennewick, Richland)	X						
Walla Walla	X						
Spokane	X					X	
Clarkston	X						
Remainder of State							

* Primary and secondary standards for these pollutants are identical.

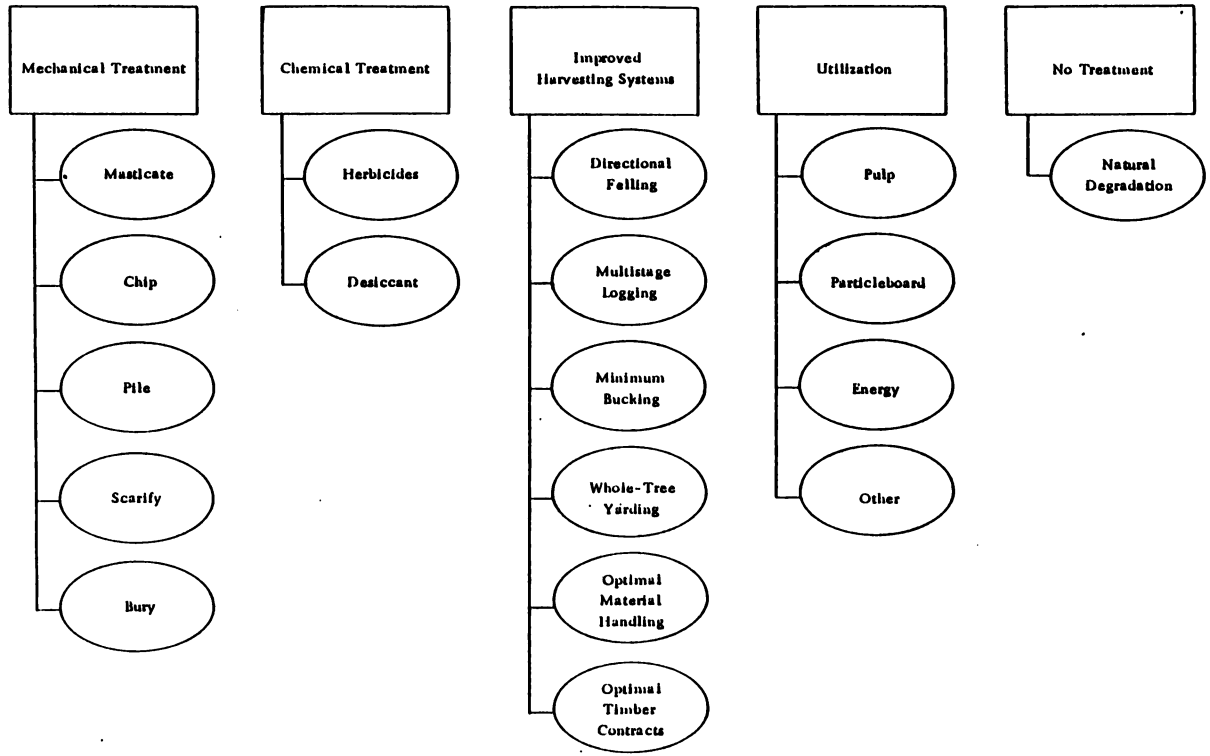
** Air Quality Maintenance Area--an area defined by states for the purpose of air quality maintenance planning.

*** Different attainment statuses were published for localities within these urban areas. If both primary and secondary standards were violated, we have indicated only that primary standards were violated.

Source: GEOMET, Incorporated

Digitized by Google

TABLE 5. ALTERNATIVES TO FORESTRY BURNING



Source: GEOMET, Incorporated

Digitized by Google

TABLE 6. WOOD PRODUCTS FROM SLASH

Products	Process or Technique	Development or Research Group	Reference	Uses
Pulp	Sulfate, kraft	--	Grantham 1974	Paper products
Particle board	N/A	USDA-FS Forest Products Lab.	Dickerhoof 1977	Counter tops, underlayments, paneling, decking
Structural flakeboard	N/A	USDA-FS Forest Products Lab.	Adams 1976	Wall and roof sheathing, paneling
Charcoal	Herreshoff reduction furnace	Olsen Lawyer	Steffensen 1971	Recreation
Wood pellets	Pelletizing	Bio-Solar Research & Dev. Corp.	ITF-FSU 10/25/77	Electric generation, steam boilers
Fire wood	--	--	--	Home heat, hogged fuel
Methanol /Oil	Pyrolysis	N/A	Grantham 1978	Heat, steam boilers
Synthetic natural gas	Chemical catalyst	Battelle Memoiral Institute	Feldmann, H.F.†	Home heating, industrial applications
Densified fuel logs	Compression	USDA-FS Forest Products Lab.	Oregon State Univ., 1977	Presto-logs, home heating, stoker fuel
Resinous glues	Pyrolytic converter	Georgia Institute of Tech.	Howlett 1972	Bonding agent
Compost & soil conditioner	Pelletizing	University of Arizona	Fuller 1966	Landscaping, agricultural
Thermosetting plastics	N/A	Oregon State University	Currier 1971	Molded products: cups, switch box, sofa leg
Glucose	Cellulose hydrolysis	N/A	Grantham 1978	Animal feed, carbohydrate supplement, sugar
Ethylene, butadiene	Ethanol extract	N/A	Grantham 1978	Alcohol
Absorbent floor covering	Hammermill sawdust	N/A	Harkin 1969	Animal bedding, packing plants, fish markets
Porous brick and tile	N/A	N/A	Harkin 1969	Reduced density and weight of clay products
Packing material	N/A	N/A	Harkin 1969	Shipping fragile items
Posts and stakes	--	Boise Cascade Corp.	Ehngren 1977	Grapestacks, fence posts
Cellulose derivatives	Dissolved pulp	N/A	Grantham 1978	Cellophane, rayon
Furan	Furfural extract	N/A	Grantham 1978	Nylon
Cork and wax	From Douglas-fir bark	N/A	Trocino 1974	Miscellaneous

†USDOE study in progress

Source: GEOMET, Incorporated

Digitized by Google

TABLE 7. POTENTIAL CONVERSION OF SLASH INTO ENERGY PRODUCTS

Technique	Product	BTU/lb	Researcher	Reference
Pelletizing process (WOODEX)	Wood pellets	9,000	Bio-Solar Research & Development Corp.	ITF-FSU 1977
Pelletizing process	Pellets	7,960	Alsid, Snowden & Associates	Snowden 1977
Pelletizing process	Pulverized pellets	8,200	U and I, Inc.	Wilson 1977
Anaerobic digestion	Methane gas	N/A	N/A	Grantham 1974
Gasification reactor	Gas	150 (BTU/cu ft)	Council of Forest Industries of B. C.	Halak 1977
Pyrolysis by direct heating	Gas	N/A	USDA-PNW FERes.	Grantham 1974
Pyrolysis by direct heating	Gas	8,200-9,600*	Forest Fuels, Inc.	Forest Fuels 1976
Pelletizing process (WOODEX)	Gas	8,700	Bio-Solar Research & Development Corp.	ITF-FSU 1977
Pyrolytic converter	Oil-soaked char	13,000	Georgia Institute of Technology	Howlett 1972
Pyrolytic converter	Wood oil	13,000	Georgia Institute of Technology	Howlett 1972
Catalytic procedure	Oil	17,000	USDI Bureau of Mines	Grantham 1974
N/A	Oil	N/A	Bechtel Corporation (USDOE)	Blackman 1978

* Depends on species

Source: GEOMET, Incorporated

Digitized by Google

Mr. WEAVER. Thank you very much for an excellent statement, Mr. Hansen.

I thank you for the inclusion of those tables which will give us excellent data for our records as to how much is burned. I notice also in table 4 that you have the total suspended particulates. Eugene and Springfield, which is my home territory, and what does "primary" mean there?

Mr. HANSEN. There are two standards, primary and secondary. The primary standards deal with health effects.

Mr. WEAVER. I see that Medford-Ashland has "secondary" marked.

Mr. HANSEN. The secondary standards are not as important. They deal with human welfare and also with the effects upon shrubs, animals, and things of that kind.

Mr. WEAVER. Are we talking about the smoke in the air from slash burning or what are we talking about in table 4?

Mr. HANSEN. All sources of emissions. Actually, the air quality control agencies have addressed stationary sources and, as you well know, they have addressed the field burning problem but they really haven't addressed slash burning.

Mr. WEAVER. From your study, which is throwing more matter in the air, field burning or slash burning?

Mr. HANSEN. Everything we are seeing to date—and this is not conclusive—leads us to believe that slash burning is contributing far more than field burning.

Mr. WEAVER. How noxious is the slash burning? I am talking about hydrocarbons, of course.

Mr. HANSEN. They affect human health. Of course, the main concern here is that the standards are not being met. It is the TSP which affects the lungs. And Congress, in passing the law, and EPA, in establishing the national standards, based them on health effects. Anytime concentrations are above the standards it creates serious problems especially for the children, for the older people, the invalids, and the weak. The higher concentrations get above the standards, obviously the more hazards it creates because this material is taken in through the lungs and the human body can only tolerate so much.

Mr. WEAVER. What makes my eyes burn?

Mr. HANSEN. It could be the material in the particulate—the TSP—this is what we are talking about.

The fact is that we don't know enough about the chemical composition of the total suspended particulates in most situations. We don't know where the particulates are coming from or what kinds of chemicals it contains. It depends upon the sources from which it originates as to how it may affect the human body.

I might mention to you that there is great concern that the current TSP standard needs improvement in that it addresses large particulate matter as well as the fine matter. There is a feeling that most of our problems are caused by the very fine particulate material and that maybe there needs to be a change in the standard. Certainly slash burning and field burning are major contributors of the fine particulate material.

Mr. WEAVER. If we reduced drastically the particulates from slash burning, according to the general standards that would mean there would be greater allowances for field burning; is that correct?

Digitized by Google

Mr. HANSEN. The State has to grapple with that problem. They have to develop an inventory of how much is being produced from which sources. Then it is a State and local problem to determine how much they are going to control field burning and how much they are going to control slash burning as well as the stationary sources.

The Federal Government is only concerned that the national standards be met. We believe it is up to the States as to how they are going to accomplish that.

Mr. WEAVER. But they all add up.

Mr. HANSEN. Yes; they all add up.

Mr. WEAVER. Therefore, if you eliminate one——

Mr. HANSEN. You allow more room for some growth and others, absolutely.

Mr. WEAVER. I don't know about growth. [Laughter.]

Mr. HANSEN. You know what I mean, Mr. Chairman.

Mr WEAVER. I was also intrigued by your statement that perhaps different harvesting systems should be used. Are you recommending that we use different harvesting systems in our forests?

Mr. HANSEN. Sir, I do not think it would be EPA's position to recommend to the Forest Service how to run the forests.

What we have here is a concern expressed by the State air quality control agencies that they did not know enough about the problem. So we contracted with Geomet to work with the Forest Service and others to get an indication as to the current state of the art.

It is for use by anybody in any way they would like, but it seems to represent the consensus of thinking of those who are most familiar with the subject.

Mr. WEAVER. Would Dr. Mason like to make any comments?

Mr. HANSEN. I would be pleased to have Dr. Mason come up.

Mr. WEAVER. Thank you, Dr. Mason. Do you have any comments?

Dr. MASON. Mr. Chairman, I was not really prepared to make a statement. I came along to answer questions.

Mr. WEAVER. Yes; I understand. I am afraid I don't have the questions to ask. Why don't you help me ask the questions I should be asking.

Dr. MASON. Let me go back into the background a bit. I was in school in Washington and Oregon in forestry, and I am quite familiar with the extent of the problem. The situation that I see encountered here is this: It was reflected in the steering committee that was established. You have two alternatives, both of which you would like to see. You would like to see the forest managed for optimum use and at the same time preserve air quality. The two are in a conflict that I do not think is really necessary.

When I talk to the Forest Service people, they know there is a problem and they want to work with it. When I talk with EPA, they know that the Forest Service has a problem.

One of the things that we accomplished with this study and in the steering committee was to get the two groups talking to one another. After they got over the initial concerns, they began to realize that there was something they could work on together.

I really see that this bill can provide a mechanism for helping some of the problems that both agencies have. It is creating a situation where they can work together.

Digitized by Google

Mr. WEAVER. Yes; that is very good. Are there any technical things, however, that we should be discussing here? I am talking about putting this in the record.

Dr. MASON. Not that I am aware of, sir. Most of these have been brought up in the discussions and in the presentations that are being made.

Mr. WEAVER. I want to thank you both very much. Mr. Hansen, I appreciate your coming.

I want to thank Dr. Ripley and the Tennessee Valley Authority because I think their testimony will be of great value. I know the people in the Northwest are watching what the TVA does on all fronts because we have similar problems with regard to energy and wood utilization.

Please proceed, Dr. Ripley.

STATEMENT OF THOMAS H. RIPLEY, DIRECTOR, DIVISION OF FORESTRY, FISHERIES, AND WILDLIFE DEVELOPMENT, TENNESSEE VALLEY AUTHORITY; ACCOMPANIED BY LAWRENCE KLEIN, WOOD BIOMASS PROJECT; AND RICHARD L. DOUB, ASSISTANT, GENERAL FORESTRY, FISHERIES AND WILDLIFE PROGRAM AREA, TVA, AND CHAIRMAN, SOCIETY OF AMERICAN FORESTERS' TASK FORCE ON FOREST BIOMASS AS AN ENERGY SOURCE

Mr. RIPLEY. Thank you, Mr. Chairman.

You have expressed an interest in TVA's efforts to utilize wood as an energy resource, and we are pleased to have this opportunity to describe some of our programs and respond to any questions you may have.

While we, in TVA, have been working specifically with wood energy production systems for only a couple of years, we have been involved for over a decade in a variety of research programs leading us to believe in the viability of this approach to energy production. Our experiments are based on our assessment of the potential for utilization of our forest resources as an alternate energy source.

The cornerstone of our investigation is built on statistical analysis of potentially available and mostly unused wood resources in the Southeastern United States—more specifically, for our purposes, in the mixed pine hardwood forests in the Tennessee Valley watershed. These unused wood resources are primarily wood biomass in logging wastes and unmarketable trees currently being left in the forests and industrial wood residues.

If I may give you a few statistics, I think you will understand our enthusiasm for this effort. First, from a pure energy standpoint, investigations have indicated that an average acre of southeastern mixed hardwoods can produce, on a continuing annual basis, the energy equivalent of 1 ton of coal, or 150 gallons of No. 2 fuel oil. Putting this into a regional perspective, we have already found that we could produce in the Tennessee Valley alone the equivalent of almost 16 million tons of coal every year.

Mr. WEAVER. Mr. Ripley, that is utilizing the full product and not just the residue; is that right?

Digitized by Google

Mr. RIPLEY. That includes three things, Mr. Chairman. It is the logging residue left in the woods, some mill residue which is still unused in our region, and a large amount of material that is left standing but should be taken out of the stands.

Mr. WEAVER. In other words, this is on top of commercial timber production for finished timber products?

Mr. RIPLEY. Yes, sir, this is our estimate of what could be used without disturbing the present forest products systems that are in place or threaten additional ones.

Skipping to a national perspective, I would now like to introduce Mr. Doub, on my left. He is chairman of the Society of American Foresters' Task Force on Forest Biomass as an Energy Source. Also I would like to introduce Mr. Klein, who is program leader for our wood-for-energy projects. I have asked them to come because we thought they might be helpful to you, sir.

In a national perspective, if we in this country were able to bring together the logging wastes currently being left in the forests, and combine them with industrial wood residues, and implement some intensive biomass production, and take advantage of additional available harvestable materials, the collective result would be an impressive 7 to 15 quadrillion Btu's—enough perhaps to exceed the amount of oil America has to import each year. So we believe it is a very significant opportunity.

Recognizing these potentials, and realizing that utilization of this resource could also provide the impetus needed to stimulate improved management on millions of acres of now poorly managed rural lands across the Nation, we set out to study and demonstrate ways of producing, harvesting, and using this resource in the production of energy.

One of the major efforts underway is the development of a biomass program designed to complement TVA's program for effective utilization of solar energy systems. The major objectives of this specific program are to develop, demonstrate, and promote technologies that include the biomass production and use—ranging from production of the biomass materials to the ultimate of use of biomass material.

We will be looking at the use of biomass for supplying heating and cooling to residential, commercial, and industrial sectors; generating electricity; and eventually producing chemical feedstocks.

The prospects for success are good. The forest resources in our power service area alone could supply the energy equivalent of some 16 million tons of coal annually and still provide the wood needed by conventional forest products industries.

I might comment, sir, that we estimate that there is standing in the Tennessee Valley watershed close to 1 billion tons equivalent of coal so a very small fraction of that could produce a large amount of energy for this region.

Our wood pyrolysis experiment, which is being undertaken on a small college campus in east Tennessee, will give you some insight into one aspect of the program. In this experiment, we are working with Maryville College to change the school's heating system from oil and gas to wood. The focal point for the demonstration is a small-scale wood pyrolysis unit, which is being installed in the college's physical

Digitized by Google

plant. If I may give you an oversimplified version of what pyrolysis does: It converts wood at very high temperatures into charcoal, a heavy oil and a low Btu gas. The system's output will be approximately 1 ton of charcoal, 140 gallons of oil, and 8 million Btu's of gas for every 3 tons of wood consumed.

Mr. WEAVER. Is this pyrolysis done onsite. The school actually has this?

Mr. RIPLEY. Dr. Klein is setting this up. There is a small pyrolysis unit that will be onsite and low Btu gas will be piped off and burned by the school.

Mr. WEAVER. You bring the wood residues to the school plant and they convert that in their pyrolysis system to a fuel that is then used also onsite to do the heating; is that right?

Mr. RIPLEY. Yes, sir.

Mr. WEAVER. At whose expense? What funds are used?

Mr. RIPLEY. The cost of this is jointly being borne by TVA and the Appalachian Regional Commission. It is a demonstration of the type you are interested in.

Mr. WEAVER. Exactly what I want to do with the Forest Service; is that right?

Mr. RIPLEY. Yes; in the Maryville College system, the gases and oils produced will be used to substitute for the fuels previously used to heat the entire campus, and the charcoal and some of the oil produced will be sold to produce a total net savings of over $30,000 a year for the college. Incidentally, TVA expects to use some of the charcoal in cooperation with Oak Ridge National Laboratories to experiment with technologies which would use the charcoal as a solid fuel and as activated carbon.

Mr. WEAVER. Dr. Ripley, the gentleman from Idaho, Mr. Symms, an extremely valuable member of this subcommittee and a representative of a very heavily timbered area has just come, and I would like you to repeat what you have just testified to.

Mr. RIPLEY. We are converting the boiler of a small college, Maryville College, from the present consumption of oil and gas as a fuel source to wood through pyrolysis. We are having built and installed a small pyrolysis unit which will be onsite and we are using mill wood waste and we plan to use chips additionally from logging waste. We will convert these wood materials into oil, low Btu gas, and char. The low Btu gas and some of the oil will feed the boiler unit. TVA plans to use a good bit of the charcoal under our agreement. The rest of it can be sold.

Mr. WEAVER. It is all done onsite, Mr. Symms. The school has the pyrolysis unit that converts the material into a fuel that can be burned.

Previous to that Dr. Ripley has said that his estimates are that nationally we have enough wood residue to do this. This is wood residues on top of the commercial use of timber to produce wood products. This is all on top of that. There is enough nationally, he says, that would exceed our oil imports today just in wood residues.

Mr. RIPLEY. It is in the ballpark, Mr. Chairman. Maybe Mr. Doub would care to comment on that.

Mr. WEAVER. I wanted to fill in Mr. Symms on this.

Mr. RIPLEY. It is a significant potential. It is a long way between potential and reality, as we know.

Digitized by Google

Mr. WEAVER. You anticipate saving the college $30,000 a year? Is that with the amortization of the plant built in?

Mr. RIPLEY. Yes, sir.

Mr. WEAVER. So we're got a net of $30,000 a year savings?

Mr. RIPLEY. Yes, sir, it does not include the opportunity which the college will have to sell some of the charcoal so it could be more. Maybe Dr. Klein would care to comment on this.

Mr. WEAVER. This is very exciting testimony. I just think it is marvelous. Won't you just proceed then.

Mr. RIPLEY. In another area, we have completed construction of a small office-type building which will demonstrate the use of wood for both heating and cooling. The heating and cooling systems will be in operation within a few weeks. This educational demonstration is being undertaken at TVA's "Land Between the Lakes," a 170,000-acre recreation and environmental education center in western Kentucky-Tennessee. In that rural setting, we are also planning a comprehensive demonstration to use wood as an energy source. From this demonstration, we will learn and show how to use wood effectively for space heating and cooling, generating electricity, and propelling our vehicles and heavy equipment. We will also demonstrate how to grow and harvest large quantities of wood in harmony with major recreation, environmental education, and wildlife programs.

In still another area, we are working to test and demonstrate the latest and best technology for direct wood combustion systems, some of which are 80 to 90 percent efficient. The technology has been pioneered by scientists and engineers at the University of Maine, and we expect it will prove ideal for use in rural settings, to heat schools, community centers, and other public buildings.

We are presently planning such a system for use in public schools in Morgan County, Tenn., a typical rural county with a total population of around 13,000. If the system works here—and we are confident it will—it can demonstrate an efficient cost-effective system for conservation with direct benefit potential for economically depressed areas in the Nation.

Another project that we have on the drawing board currently is a comprehensive effort to work with a small rural township in the development of a plan for total energy independence. The concept here involves state-of-the-art energy conservation measures coupled with management of watershed and other rural woodland resources to produce wood for fueling alternate energy mechanisms. The end result will be economic savings to the small community and increased jobs and land management sensitivities in the rural area. We hope to have more on this for you in the coming year.

Finally, we have some preliminary results from a study we undertook in a rural Tennessee county last winter which may be of interest. In this study, a local electric utility and two major manufacturers joined TVA in placing 90 energy-efficient wood stoves in homes for the purpose of determining economic benefits and problems associated with using wood for heating in a contemporary home in a rural setting. These are low-population density areas. Preliminary results indicate a few problems, but the savings are substantial, especially in rural areas where wood is readily and economically available.

Digitized by Google

The projects I have described—and they represent only a sample of TVA's activities in this area—are not independent efforts. We are coordinating our work with the Department of Energy, the Department of Agriculture, and the Appalachian Regional Commission, and they have expressed interest in joining us in several other efforts. Incidentally, this subcommittee might be interested in knowing that the U.S. Forest Service is offering help and we certainly would be glad to have its help directly in supplying wood to the Maryville College—that is, additional wood for this pyrolysis effort from the Cherokee National Forest.

I want to thank you, Mr. Chairman, and Mr. Symms, for the opportunity to be here and to talk with you. If you have any questions, of course, we will be happy to answer them.

Mr. WEAVER. I want to thank you very much.

I have a number of questions.

I would like to say that the University of Oregon in my hometown of Eugene, Oreg., has always used hogged fuel to heat its steamplant. About 10 years ago, they were going to convert to natural gas and some problem came up and they never quite got the job done, so here we are now, still using hogged fuel. But I think that some of the technologies that you are developing in pyrolysis, for instance, might even be a more efficient way to go. We look to this material, the wood residues, in the Northwest, where they are greater than anywhere else because of the old growth and the amount of material on old growth that cannot be used for commercial timber. So we are sitting on a gold mine there.

The Forest Service testified today in support of the bill, subject to a number of amendments which I personally agreed to, because I think they will strengthen the bill. I would urge the gentleman from Idaho to look the bill over with the amendments and perhaps we could discuss jointly sponsoring this. We could introduce a new bill later.

Mr. SYMMS. Thank you, Mr. Chairman.

Mr. WEAVER. Generally the forests in the South, Dr. Ripley, are privately owned.

Mr. RIPLEY. That is right, Mr. Chairman.

Mr. WEAVER. Does TVA own any forest land itself?

Mr. RIPLEY. We have a few acres of operable land. It is somewhere around 200,000 to 300,000 acres. That would include our "Land Between The Lakes" which covers about 170,000 acres.

Mr. WEAVER. So your general duties are simply to oversee the general forestry situation in the watershed?

Mr. RIPLEY. Yes. Also to advance technology and to assist the States where we can in the breakthrough opportunities. That is a role that we have assumed since the beginning. TVA was established when the watershed was in very bad shape. You probably know that, Mr. Chairman. There was a major reforestation effort.

Mr. WEAVER. So your general situation as TVA foresters is to oversee that area. How long have you been moving in the direction of utilizing wood waste? You mentioned 10 years in your testimony.

Mr. RIPLEY. Yes, perhaps longer in less specific ways. We work with the forest industries. We call attention to opportunities for utilization of wood materials for products, of course, when we can. It is a natural extension for us, particularly as an energy agency, to be interested in the energy aspects of wood.

Digitized by Google

Mr. WEAVER. It is very natural. Do you get close cooperation? Would you assess that you get close cooperation with your small woodlot owners and owners of private forest lands?

Mr. RIPLEY. I think we are making progress with this. This is a difficult problem nationwide. Sixty percent of the watershed is forested giving as some 20 million acres; 16 million acres is in private ownership. There are 360,000 small owners. We are working with the States and with the Forest Service in various programs trying to bring the small owner into a good competitive economic situation and sound environmental approach to resource management. The benefits are not only in timber products but also in wildlife and other benefits.

Mr. WEAVER. In your watershed would you say that timber production is increasing or declining?

Mr. RIPLEY. The timber volumes are increasing.

Mr. WEAVER. Are you talking about harvested volumes?

Mr. RIPLEY. No. At the present time I think the harvest is pretty well stabilized. However, the volumes, that is the standing volumes of material, have been increasing steadily. In fact, in some heavily forested counties that we have surveyed recently, we have had a doubling of volume in these counties in the last 15 or 20 years.

Mr. WEAVER. What are the main species?

Mr. RIPLEY. Mixed oak and other hardwoods.

Mr. WEAVER. Mr. Resler testified earlier today that in the Northwest we could achieve, that is, the lumber industry could achieve self-sufficiency in energy by 1990. How would you compare that to your area? Do the various processors use their own wood residues for fuel?

Mr. RIPLEY. Some do extensively.

May I turn this over to Dr. Klein?

Mr. WEAVER. Yes; that will be fine.

Mr. KLEIN. Mr. Chairman, historically wood has been used as a fuel and right now most of the large consumers of energy, particularly in the pulp and paper industry, either have converted or are in the process of converting to some wood waste boilers at their plants.

Some of the small sawmills without drykilns who don't need that much energy are not at present converting. But the ones that have drykilns or equipment that use tremendous volumes of heat are now converting.

Mr. WEAVER. Could you give a general estimate that 20 percent of the energy needs are being met in wood waste? How about the industry now? How about 40 percent?

Mr. KLEIN. If you include the pulp and paper mills, probably 10 percent of the sawmills and other plants are using that for energy. Maybe the 10 percent of the sawmills, let's say, and about 25 percent in the secondary manufacturers such as the furniture plants and things like this.

Mr. WEAVER. How about pulp and paper?

Mr. KLEIN. We are presently running there around 20 percent. In the next 3 years they will probably reach about 75 to 80 percent.

Mr. WEAVER. They will?

Mr. KLEIN. Yes, sir, most of the plants are already in the process of installing wood-fired boilers.

Mr. WEAVER. They are the ones who use by far the most energy. Isn't that right?

Digitized by Google

Mr. KLEIN. Yes, sir, they do. Most of them are either in the process of installing boilers or are working on the economics and getting ready to install wood-fired boilers for the major portion of their energy.

Mr. WEAVER. Would you say that the economics of this have dictated favorably that they can supply their own energy cheaper; is that right? Is this an economic move by them?

Mr. RIPLEY. Yes; maybe I could comment on this.

We attended a dedication ceremony yesterday in Knoxville, Tenn., for Woodex. You have a Woodex firm that started actually in Oregon, and they now have a small plant just completed.

They propose to sell pelletized wood from waste at about—to quote their figures—$26 a ton. They predict something on the order of 9,000-Btu level for this material.

At the same time in the Knoxville area stoker coal is running $60 to $70 a ton with a Btu potential of about 12,000.

I think that if they can crack into the market that will give you some idea as to why the major pulp and paper companies are interested in this. Of course coal is one of the lower cost fuels.

Mr. WEAVER. A good friend of mine is the one who put the money behind that in Oregon. He was losing a lot of money because he couldn't find anyone to sell it to. I have not contacted him recently, but I think I will to see how he is developing his market.

Do you have any advice to give us in the Northwest in developing energy from wood waste. Do you think that my utility, the Eugene Water & Electric Board, will be able to develop wood as a boiler fuel to produce electricity?

Mr. RIPLEY. I think there are great opportunities there. I am not closely familiar, of course, with the wood waste opportunities in the Northwest although I know they are very large. Perhaps we are talking about the regions where this has the greatest meaning in our country.

A generalized answer would be that certainly there is an opportunity there. We need to bring technologies together and further develop this.

Mr. WEAVER. Is the TVA planning, let's say, small electric generating facilities?

Mr. RIPLEY. We are certainly considering that. We have one location at Land Between the Lakes where we may be able to fuel directly.

Mr. WEAVER. Producing electricity?

Mr. RIPLEY. Yes. Although I must say this, Mr. Chairman: We see this as a tricky area. Our country is short on oil and gas. We kind of feel that in a good active coal field, we have to be careful not to dislodge existing fuel sources because coal, we feel, is going to continue to be an important fuel source. So, we feel we should target on oil and gas where we can.

Mr. WEAVER. We heat with electricity in my area. As a matter of fact, 95 percent of all new construction heats with electricity.

Mr. RIPLEY. A high percentage of the Tennessee Valley region also heats with electricity.

Mr. WEAVER. It does?

Mr. RIPLEY. Yes; but TVA's system is coal-fired, nuclear-fired, and hydro.

Mr. WEAVER. Mr. Symms.

Digitized by Google

Mr. SYMMS. Thank you, Mr. Chairman. I apologize that I have been detained in the other room. As often happens, we have three committees meeting at the same time. This is one of those days.

I would make a comment, Mr. Chairman, that the Potlach Corp., most recently from Lewiston, Idaho, is now in the process of putting in a cogeneration Lewiston pulp-paper mill which is a very big plant, as I am sure you are aware. They are excited about the potential there. I cannot give you any of the facts and figures as to what it is, but it will make some contribution. They think they may have some electricity to put back.

Mr. RIPLEY. I was not specifically aware of that, but I think the opportunities for wood as a fuel in cogeneration are large.

Mr. SYMMS. It is my understanding that the Louisiana Pacific Co. has come out with a white paper where they have done a good deal of research.

Scanning through your testimony, it looks quite promising and very intertesting. This would back up what you said about potential. I don't think they have concluded about the reality but there is certainly a great potential there.

Thank you, Mr. Chairman.

Mr. WEAVER. Gentlemen, we want to thank all three of you very much. If you have any more comments, I would like to hear them.

Mr. RIPLEY. Mr. Chairman, you might be interested in an editorial that I prepared for the American Forests magazine several months ago which relates to these issues. I would like to offer it for the record.

Mr. WEAVER. Without objection, we will place it in the record at this point.

[The editorial referred to above follows:]

Digitized by Google

EDITORIAL

Energy and the Wood-basket

By THOMAS H. RIPLEY, Vice President, AFA

WHEN CASCADING power failures created an uneasy darkness in our large eastern cities and, soon after, the Mideast oil embargo of 1973 was announced, the future of America's forests may have undergone a drastic change. Those events forced attention on our nation's forests—a renewable, available, and potentially very significant energy source.

Wood is stored solar energy. An average acre of southeastern mixed hardwoods can produce the equivalent of one ton of coal or 150 gallons of No. 2 fuel oil a year, perpetually.

Clearly, our forests can become a significant item in America's annual energy budget, which now tops 75 quadrillion Btu's (quads). Oil, 50 percent of it imported, supplies about half of our energy needs. Wood accounts for less than two percent. Logging wastes left in the forests industrial wood residues, intensive biomass production, and additional available harvest could, combined, produce an impressive seven to 15 quads—enough to make a big dent in the amount of oil imported each year.

Some facts offer an interesting insight into wood's potential. A dry ton of wood residue in chips, or two tons of green wood, is roughly the equivalent of three-fourths of a ton of 10,000 Btu/pound coal. In the mixed hardwood forest of the southern Appalachians, the logger who removes 1,000 board-feet of salable wood from an average acre today leaves 11 tons of green wood in tops and limbs lying on the ground. This equals about ~~7,500~~ 750* gallons of No. 2 fuel oil, or five tons of coal.

The opportunity to increase simultaneously the supply for traditional wood uses is significant too. Indeed, the increased demand could provide the impetus needed to stimulate far more intensive management of the millions of acres of poorly managed forests—mostly small private holdings in the East. The opportunities might be expanded even farther if it became economical to harvest the millions of board feet of prime timber in generally sparse, cull-laden forests for multiple uses, including energy.

Despite the opportunities, there is concern in some quarters that existing supplies of wood or traditional uses may be depleted if the use of wood for energy grows. Indeed, this can happen if we do not develop some strong policy positions to undergird national programs. In the short run, intensified harvest to produce wood for energy can be planned so as to avoid major conflict. In the long run, improved forest management could fill the woodbasket for all.

Much work has already been done to analyze ways to use wood resources in energy production. Newer approaches to direct heating, using heat-storage systems, could offer a major breakthrough in the use of wood. Another approach would use pyrolysis—a process which consumes wood and other organic materials and produces a low-Btu gas, a heavy oil, and charcoal. These products could then be used in existing energy-production processes with moderate or no conversion cost. Significantly, the gases and oils produced could generate immediate national savings in consumption of imported oil and gas.

Those of us who own land or work in our forests—especially those of us who work with The American Forestry Association—have an opportunity to contribute to the solution of one of our nation's toughest problems. We can be on the cutting edge of the development of technologies that make possible the harvesting and use of wood to support both our forest industry and the national goal of energy independence. But *we must insist* that we use current waste first, and avoid cutting into raw materials vitally needed for paper and lumber. *We must insist* that wood for energy be substituted directly, wherever possible, for oil and natural gas. And finally, *we must insist* that we regulate our appetites in order to sustain forest yield and, wherever possible, to increase growing stock.

[*Corrects typographical error.]

Digitized by Google

Mr. WEAVER. Dr. Klein.

Mr. KLEIN. Mr. Chairman, I would like to make a comment regarding the pyrolysis unit itself. The one that we are testing is a portable unit which fits on a 34-foot-long tractor-trailer bed, it is self-contained and weighs about 19,000 pounds. One aspect that we would like to explore in the future it its use in the woods in a portable mode where it would be self-sustaining and be able to supply either gas to fire an engine or something like that.

Mr. WEAVER. Forgive me. Let me ask you another question or two on that. Would you please describe that pyrolysis situation. It is a 19,000-pound portable unit?

Mr. KLEIN. Yes.

Mr. WEAVER. What is its kilowatt capacity in equivalent terms?

Mr. KLEIN. Its feed rate of wood waste is about 3 tons an hour. As Dr. Ripley has indicated, this would produce approximately 1 ton of charcoal, about 140 gallons of oil, which is equivalent to about a No. 6 fuel oil, and 8 million Btu's of low-Btu gas.

As for the portable mode, we see its ability in a remote situation to supply the energy, let's say, to a logging operation, and then, conversely, the char and excess oil that you would produce in highly concentrated Btu form is much cheaper in terms of it being portable than it is any other way. It would be much cheaper that way.

Mr. WEAVER. Anything else like this in the country right now, or are you pioneering?

Mr. KLEIN. Not that we know of. This is one of the reasons we tested it. I am sure there are other units which we have looked at. Some people have indicated that others have some portable units but this was the most adequate that we could find.

Mr. WEAVER. We are heavy in hydroelectric in the Northwest, of course. I translate all energy forms into kilowatt hours. That helps me understand them in relative terms.

Can you give me any idea as to what this produced in terms of Btu's translated into kilowatt hours? I had an argument with a utility executive yesterday. My records show that, for instance, a barrel of oil equals 5.6 million Btu's equals 640 kilowatt hours. I got that from an engineering manual. He challenged that and said it was completely wrong.

Mr. RIPLEY. We have every statistic in the world other than that on our list. I am embarrassed.

Mr. WEAVER. Can you translate it into barrels of oil?

Mr. KLEIN. It would produce 5,000 kilowatts per hour if you had a turbine there and ran it through.

Mr. WEAVER. It is a 5-megawatt plant?

Mr. RIPLEY. No.

Mr. KLEIN. It would be 5,000 kilowatts. It would be capable of producing that if you generated steam with all the energy output of the unit and then used the steam in a turbine.

Mr. WEAVER. You are talking about the portable unit?

Mr. KLEIN. Yes. It produces about 43 million Btu's of output an hour.

Mr. WEAVER. That's 43 million Btu's an hour?

Mr. KLEIN. That is output. If you figure the input and the average Btu content in the wood, it is about 51 in and 43 out which is not too bad.

Digitized by Google

Mr. WEAVER. That is an amazing efficiency. That is around 80 percent, I would say.

Mr. KLEIN. Yes.

Mr. RIPLEY. That is a fuel conversion unit.

Mr. WEAVER. Yes. Then you will lose some when you burn the fuel.

Mr. RIPLEY. Yes. I would be delighted to make these calculations available for the record.

Mr. WEAVER. Yes; I would like that very much.

Without objection, the record will be left open for the purpose of inserting this additional material.

[The additional material submitted follows:]

In a small electric generating plant, one can assume that it takes 12,000 to 14,000 Btu's to produce 1 kilowatthour of electricity. Thus, with an output of 43 million Btu's per hour from the pyrolysis unit, you could produce between 3,583 and 3,071 kilowatthours of electricity for every hour of operation. This is assuming that you are burning charcoal output as well as the gas and oil.

The oil and gas output is equal to 17.6 million Btu's, which then equates to 1,467 and 1,257 kilowatthours, respectively. Thus, without burning the charcoal, one cannot generate large amounts of electricity.

Mr. WEAVER. Who manufactured this unit? Did you do it yourselves? Did you custom make it?

Mr. KLEIN. No, sir, Enerco, Inc. in Langhorne, Pa., was the developer of this unit.

Mr. WEAVER. They custom made it for you?

Mr. KLEIN. Yes; it is being custom made right now. We are in the process of trying to test out the first unit that is being built to make sure it is going to work before we get it. We want to make sure that the hookup to the Maryville College boilers is right. They burn natural gas and oil and we are going to use the oil and the gas from this unit to heat the college.

Mr. WEAVER. Then if it works, as you think it will, then you plan to make more of them?

Mr. KLEIN. Yes, sir, I am sure the company will. We would encourage other people to use them.

Mr. WEAVER. I see what you mean.

Mr. KLEIN. I might mention that we feel it would be a considerable savings to the country. In fact, just at this Maryville College, they burn annually about 240,000 gallons of No. 2 fuel oil and 18 million cubic feet of gas. We are hoping that we can replace that with this unit.

Mr. WEAVER. I am absolutely fascinated with this. When I talked to Dave Freeman about a week ago, and he was giving me some hints about this, I said, "My God." I wanted Dave Freeman to come out to Bonneville.

[Laughter.]

Mr. RIPLEY. He mentioned he was in touch with you. Perhaps he didn't tell you that if this does not work, that Mr. Klein and I will shovel a lot of coal.

[Laughter.]

Mr. WEAVER. Thank you very much, gentlemen. We appreciate your testimony.

We will call now Mr. Joseph C. Dose and Mr. Dale Zimmerman from the Bureau of Land Management.

Mr. DOSE. First I would like to introduce Dale Zimmerman who is our Chief, Division of Minerals, Bureau of Land Management.

[The prepared statement submitted by Mr. Dose follows:]

Digitized by Google

STATEMENT OF JOSEPH C. DOSE, CHIEF, DIVISION OF FORESTRY, BUREAU OF LAND MANAGEMENT, DEPARTMENT OF THE INTERIOR, BEFORE THE FORESTS SUBCOMMITTEE OF THE COMMITTEE ON AGRICULTURE OF THE UNITED STATES HOUSE OF REPRESENTATIVES ON UTILIZATION OF WOOD RESIDUES AND GEOTHERMAL STEAM DEVELOPMENT.

Mr. Chairman:

Thank you for the opportunity to participate in your discussion of utilization of wood residues. We certainly support the objective of increasing utilization of these resources, and specifically, those residues that are left in the forests after harvesting in the Douglas-fir region of western Oregon and Washington.

The Bureau of Land Management manages 2.4 million acres of commercial forest lands in western Oregon of which 1.9 million acres are available for timber production under the principles of multiple use and sustained yield. The annual allowable cut of 1.172 billion board feet is sold annually. The harvesting of this timber involves approximately 20,000 acres annually. Most of this acreage is in overmature Douglas-fir timber stands.

A study by the Pacific Northwest Forest and Range Experiment Station indicates that approximately 2,000 cubic feet of residues per acre are left on Bureau of Land Management harvest areas in the Douglas-fir region of western Oregon. This totals 40 million cubic feet of residues that are generated annually on Bureau managed lands in western Oregon. The study also indicates that approximately 80 percent of this residue is capable of producing a sound pulp chip.

Digitized by Google

Economics play a major role in determining the degree to which wood residues are utilized. Utilization of wood residues from lumber and plywood manufacturing is consistantly high. In the Pacific Coast over 90 percent of the wood and 70 percent of the bark residues are used. They are not only used to manufacture products, but are an important energy source for many mills. The transportation from the forest to the mill of this residue is generally non-discretionary. It comes as a part of the merchantable logs and is available at the mill without cost. State laws regarding burning and dumping make unused mill residues a liability to the timber industry.

Utililzation of residues from timber harvesting and other forest management activities is more cyclic, more responsive to supply and demand. During periods when the mills are processing a high volume of logs, they also generate a high volume of residue. During such periods, utilization of residues from forest harvesting decreases. The opposite is true during periods of low log processing. The demand for wood chips for export also effects the utilization of harvesting residues in western Oregon.

Residues often present a forest management problem after timber harvesting. The two major problems are increased fire hazard and physical impediment to reforestation efforts.

We employ two methods to reduce this residue to acceptable levels. One is burning in-place and the other is moving and piling residue for disposal by burning or other means. Moving and piling is usually much more expensive than burning in-place and is used primarily to protect soils or air quality.

Digitized by Google

Moving and piling often encourages better utilization of residues because the cost of moving some of the residue to loading points is shared by the merchantable timber.

Bureau timber sale procedures encourage utilization of residues in several ways. As a general practice we use the lump sum method of selling timber. In this method the purchaser pays a lump sum for the designated timber regardless of the amount removed, thus providing an incentive for better utilization of residues. Another incentive is provided by only charging the merchantable timber road maintenance fees for the use of Bureau roads. Thus, the merchantable timber contributes to the road maintenance fees of residue being removed.

Utilization of residue for fuelwood has also increased in recent years. Many recently completed harvest areas are designated as wood yards and the public directed into such areas to cut fuelwood. Last year the Bureau of Land Management disposed of approximately 28,000 cords or 3.5 million cubic feet of fuelwood in western Oregon, primarily to individuals for personal use.

You also asked us for information on geothermal steam activity in Oregon.

Pursuant to the Geothermal Steam Act of 1970, the Secretary of the Interior is authorized to issue leases for the development and utilization of geothermal steam and associated geothermal resources in lands administered by him and in lands administered by the Department of Agriculture through the Forest Service.

33-770 O - 78 - 5

Digitized by Google

If the lands to be leased are within any known geothermal resource area or "KGRA" they must be leased to the highest qualified bidder by competitive bidding. If the lands are not within a "KGRA", the qualified person first making an application may receive a lease without competitive bidding.

As of August 1, 1978, 30 competitive leases have been issued covering a total of 60,685 acres. Another competitive leasing sale will be held on October 19, 1978, for the Alvord Desert area in Southeast Oregon.

With respect to noncompetitive leases, as of August 1, 1978, 118 leases have been issued in Oregon covering approximately 181,838 acres, and 426 applications are awaiting processing. Within the next six months, we expect to process another 75 to 100 applications.

Some geothermal leases are currently under development. Included in these are a 4,000 foot well being drilled at Old Maid Flats on Mt. Hood. As soon as this well is completed, another 2,000 foot well is scheduled to be drilled at the Timberline Lodge on Mt. Hood. This project will utilize geothermal steam for space heating. In addition, several temperature gradient holes, to test the temperature of the underlying geothermal resource, have been drilled at Vale, Oregon, by the Chevron Oil Company.

With respect to the future development and use of wood residues and geothermal steam as energy resources, we have had preliminary inquiries from local utilities about using these resource in future projects. The Secretary of the Interior is responsible for issuing and administering geothermal leases. Much of the wood residue is in the National Forests. Such projects would, therefore, involve coordination between the Departments of the Interior and Agriculture.

Digitized by Google

Mr. WEAVER. Thank you very much.

Do you feel that your lump sum bidding means you don't leave as much wood residue out in the forest?

Mr. DOSE. We think the incentive is there for the industry. They have paid for it and anything they can economically bring in is good. At least they are not charged again for it.

Mr. WEAVER. I understand. We have run into a problem. I don't know how widespread it is. I am talking about BLM sales. We have some small operators who would like to go in and get some of this residue. They would like to take it out and sell it.

The original purchaser must signoff first on the sale before they can put it up for bid again. Some of the small operators will contract with the original purchaser but sometimes the original purchaser says that his liability is too great with insurance problems and somebody might get hurt. Or, they say that the road might be disturbed, costing them quite a bit of money to fix. So some of the original purchasers say it is not worth it and that they don't want to take that liability. They would rather leave the residue on the ground. The upshot is that it continues to be burned out in the forest.

What can we do to remedy this situation? Is a change of contract necessary? Is a change in the regulations necessary? Are these changes necessary to make a more orderly and more feasible operating process to get these residues out and to let these people go in and get them?

Mr. DOSE. I don't believe a change in our regulations would be necessary. Possibly a change in our contract would help. There is a problem with liability from the original purchaser.

What we often do is this: In some cases where there have been considerable residues that we felt were marketable, we have released the original purchaser from his remaining contract obligations and we sold it to a new purchaser.

Mr. WEAVER. Yes; I know that. But, in some instances, not all, that is not working very well.

What can we do? Can the director of the BLM initially require different contracts so that we can be sure that these residues are gotten out of the forest? Is that feasible?

Mr. DOSE. That basically would be the answer, that is, to revise the contract to accommodate that situation.

Mr. WEAVER. Would you give the subcommittee for its record, sir, and for the transcript and for the file memo stipulating exactly this. I am not asking you to recommend anything, but I would like for you to say what you think should be done and what options you have to make the contracts or whatever such that the problem I mentioned could be dealt with. Could you do that for us? The big operator may or may not want to get the residue out. There are lot of vigorous young people out there who would like to go out in the woods and get this.

Mr. DOSE. I would be happy to do that.

Mr. WEAVER. That will be fine. Without objection, the record will be left open at this point for the purpose of inserting this additional information.

[The information submitted follows:]

Digitized by Google

Question: Can the Director of the BLM initially require different contracts so that we can be sure that these residues are gotten out of the forest?

Answer: There is no ready solution to this problem of assuring utilization of wood residue if the original purchaser does not wish to utilize it. Under the Bureau of Land Management contract terms, the original purchaser owns the logging residue until his contract rights are terminated. The original purchaser or his assignee must also complete all contract requirements before he can obtain a contract release. However, the Bureau of Land Management does have two options currently at its disposal which can provide for another party to utilize logging residue that the original purchaser does not want. In addition, we have identified two other possible options listed third and fourth below.

Option I - Assignment

Currently, the purchaser may assign his contract to another party, with Bureau approval, and the assignee must agree to accept the contract in total. Present regulations preclude partial assignments of rights and obligations.

Option II - Contract Termination

If it is evident that logging residue remaining on a sale area might have significant value, and the Bureau and purchaser agree, contractual requirements, and values such as slash burning or cutting and removal rights may be waived and the contract terminated. Once this has been done, the Bureau is free to sell the logging residue to another party.

Possible Option III - Partial Termination

The standard Bureau of Land Management timber sale contract provides for simultaneous use of the contract area by others. However, this does not mean that the Bureau can force the purchaser to permit another operator to relog his residue. The possibility of granting partial termination of some contract rights and obligations so that portions of the contract area could be resold appears worthy of further study. A partial termination would have to be acceptable to the original purchaser, and the new purchaser would have to assume those contract requirements which were waived to permit partial termination.

Possible Option IV - Partial Assignment

The possibility of allowing the original purchaser to assign a portion of his contract rights and obligations to another party also needs further study. A partial assignment would have to be acceptable to the original purchaser, the assignee and the Bureau.

It should be understood that these options are initial ideas which can be explored and should not be considered recommendations. They have not been reviewed for legal adequacy or undergone complete staff review. It is important to note that more complete utilization of logging residues hinges on not only economics, but also on the full cooperation among industry, the small operator, and the Bureau of Land Management. We intend to be responsive to any viable opportunity to further the utilization of logging debris from Bureau timber sales.

Digitized by Google

Mr. WEAVER. I would like to see what options we have for resolving this situation and then we could perhaps discuss at a later time what we actually will do.

As for the geothermal situation, it appears from the data that you have presented the subcommittee that you are moving on geothermal leasing. There have been some people who have felt that it is going slow. However, it looks like you are moving on this now. I have looked over the lists of the lessees and they seem to be the large oil companies frequently.

Mr. Zimmerman, could you comment on that?

Mr. ZIMMERMAN. Mr. Chairman, this is basically the situation now. The majors and large independent oil companies seem to be the forerunners in the leasing of geothermal. There have been, however, indications that there have been small companies and utilities and so on that are moving in. However, it is still a relatively infant industry and requires considerable technological expertise and advances before it really becomes economical to the point where the smaller operators can get into it. I think that is basically the stage at which we are in the industry.

Mr. WEAVER. For purposes of this hearing, of course, we are interested in the slash utilization. One of the things that has been suggested is using warm water as opposed to the steam. It is much more readily available from the geothermal deposits. We could build it up to steam by burning the slash.

Mr. ZIMMERMAN. Yes.

Mr. WEAVER. Do you have any comments on that?

Mr. ZIMMERMAN. Mr. Chairman, at this point the only real proven technology is with dry steam. The only known dry steam field that is being developed now is at the Geysers in California. But there is considerable research being done with respect to using hot water.

Mr. WEAVER. Boosting it?

Mr. ZIMMERMAN. Yes. I might volunteer this, Mr. Chairman. With respect to a question that you had posed to Mr. Resler from the Forest Service, there is authority for utilities such as the Eugene Water & Electric Board, to acquire leases and also to place plants even on national forest lands notwithstanding the fact that Mr. Resler said he preferred that they be on private lands.

Mr. WEAVER. There is not much private land up there.

Mr. ZIMMERMAN. Yes; that is right. But there is authority under the act of 1970.

Mr. WEAVER. Right. As of right now, do you prefer to let the geothermal developer do it and then buy the steam or water from them? That is, as opposed to developing it themselves?

Mr. ZIMMERMAN. Yes.

Mr. WEAVER. Do you have any control of the contracts of this kind when you do the leasing? I don't know if you know it or not but the Geysers and the oil company that developed the Geysers had a clause in the contract that said if the price of oil went up the price of steam was going to go up automatically.

Mr. ZIMMERMAN. Right.

Mr. WEAVER. That is the kind of contract I do not want to see go into effect. Do we have any control on this? When you process the aplications, do you have any control of that sort?

Digitized by Google

Mr. ZIMMERMAN. Not really. I think there is authority in the Geothermal Act for the Secretary to monitor the price, that is, the resource and the end product.

Mr. WEAVER. What is your royalty basis for this?

Mr. ZIMMERMAN. By law, it cannot be less than 10 percent and no more than 15 percent.

Mr. WEAVER. Of the wholesale price?

Mr. ZIMMERMAN. Yes; there is a provision for it to go up by 50 percent to a maximum of 22½ percent.

Mr. WEAVER. By direction of the Secretary?

Mr. ZIMMERMAN. That is only after the first 40-year period.

Mr. WEAVER. We so far, on BLM land do not have any actual operating geothermal operations, do we?

Mr. ZIMMERMAN. Not at this point.

Mr. WEAVER. You are close on some of them?

Mr. ZIMMERMAN. Yes; we are close in both California and Utah.

Mr. WEAVER. Very good.

I want to thank you very much for appearing. I will have to go answer a quorum call on the floor of the House.

After I return, we will call our next witness.

[Recess taken.]

Mr. WEAVER. The subcommittee will resume its sitting.

We will now call Mr. Gary Allison, Wheelabrator Cleanfuel Corp. He is accompanied by Mr. S. Brown Milligan, project manager.

We look forward to your testimony.

STATEMENT OF GARY ALLISON, PRESIDENT, WHEELABRATOR CLEANFUEL CORP., WASHINGTON, D.C.; ACCOMPANIED BY S. BROWN MILLIGAN, PROJECT MANAGER

Mr. ALLISON. We are here, in fact, to testify in support of your bill, H.R. 13324. It specifically involves some of the programs we are working on.

Perhaps a bit of background with regard to our company would be in order. We have been involved in the energy business. Probably by most measures, we are an oldtimer in the energy business. We made a corporate commitment to that business in 1973 during the height of the oil embargo.

We find that most people at this point, perhaps, remember the oil embargo about as well as we remember having our tonsils removed. We see that particularly in the mode of when we are attempting to put our ultimate energy packages together as we configure them which is fundamentally our package being that we want to design, construct, finance, and operate ultimate energy facilities.

Under that mode, we became involved in 1973 and 1974 in an assessment of municipal refuse, biomass industrial refuse, coal conversion, gasification, liquefacation, solefaction, and so forth. Specifically, it would relate to your recent bill in that we are designing a biomass fueled power facility capable of taking in approximately 1,000 tons per day of biomass and generating electrical power to the maximum extent of about 50 megawatts.

Mr. WEAVER. Where are you doing this?

Digitized by Google

Mr. ALLISON. We are currently specifying that facility for the State of Maine. In addition, we recently took over a plant in your State for biomass liquefaction at Albany for research and development of that process.

In addition, we have a facility that has been online approximately a year and a half now that converts 1,200 tons a day of municipal refuse, garbage, to 400,000-pounds-an-hour processed steam that goes across the fence into an industrial complex. That facility has been online for a year and a half, and for all practical purposes, it has not missed a beat from the standpoint of 24 hours a day, 7 days a week, 365 days a year, delivering the 400,000-pounds-an-hour processed steam.

Mr. WEAVER. Do you make money on it?

Mr. ALLISON. We, on the bottom line, have not made money yet. We expect it to turn that corner very shortly from the standpoint of some of the incentives associated with bond issues and investment tax credits. On that basis, yes, we are on the plus side of our investment—but on a cash flow basis, no. We expect to turn that corner some time in the next 30 to 60 days.

That particular facility was an investment on our part of near $50 million. We designed and constructed it. We financed it, own, and operate it. We cut contracts on the front end with 13 municipalities to deliver the 1,200 tons per day of garbage, and we cut contracts on the output end with the industrial complex for the long-term purchase of that steam.

Mr. WEAVER. Can you mix wood waste with this? Do they mix?

Mr. ALLISON. The concept is really municipal waste. We do, in fact, get substantial amounts of tree trimmings and that sort of thing of a residential variety.

From an overall standpoint, the variety the American people throw away in their garbage cans, you would not want to know about simply on the basis of the fact that we have had everything from Honda Civics to 50,000 gasoline drums go through the plant with quite exciting results.

But many of those things we have learned a lot about in terms of handling that refuse.

Mr. WEAVER. You do not try to sort the stuff? You just put it all through?

Mr. ALLISON. Exactly. As a side comment, if you would like to visit that particular facility at any time, I would be delighted to give you a tour.

Mr. WEAVER. I would like very much to do that.

Mr. ALLISON. It is in the North Shore area of Boston, about 3 miles from Logan Airport. It has been online for about 1½ years. It is very impressive.

Mr. WEAVER. If I am in Boston, I will do that.

Mr. ALLISON. With regards specifically to biomass, we started at about the same time that we started the municipal refuse assessment. We started an assessment of biomass, particularly agricultural and forest residues. In concert with the Department of Energy, approximately a year ago, we started the work on a project called biomass cogeneration. Mr. Brown Milligan, who is here with me, is the project manager on that program. He and his team have evaluated 22 different sites in the State of Maine wherein we would, within approximately a

Digitized by Google

50-mile radius of each of these 22 sites, be bringing in on a daily basis 1,000 ovendry tons and generating 500,000 pounds an hour of processed steam which would, in turn, be diverted from a standpoint, at least, of power generation—that is, diverted in a cogeneration mode to the generation of approximately 30 megawatts of electrical power and approximately 200,000 pounds an hour of processed steam to be exported into an industrial complex.

The facility design is scheduled—the environmental assessment and the biomass procurement logistics, economics, and so forth, is scheduled to be completed in May 1979. At that point in time, we will submit the results of our technical and economic and environmental characterization to the Department of Energy such that we and they contemplate constructing the facility that will result from Mr. Milligan's efforts.

Mr. WEAVER. Mr. Milligan is in charge of that? Does it incorporate the Albany operation?

Mr. ALLISON. No; those are two separate projects.

Mr. WEAVER. I see.

Dr. Hart, whom I assume you know, will testify in Eugene, Oreg., or we hope he will.

Mr. ALLISON. As a matter of fact, I was with Dr. Hart week before last. Yes, he does plan to be there. We look forward to that. They are two separate programs, however, Mr. Chairman.

Mr. WEAVER. Are they similar?

Mr. ALLISON. Yes, they are similar with the exception that the facility in Albany, being a research and development facility, has what you could characterize as a second generation technology. It is a pilot facility capable of consuming 3 to 5 tons per day of feed stock.

The program Mr. Milligan is working in is approximately 200 times that size in the sense of taking 1,000 ovendried tons per day——

Mr. WEAVER. That is in Maine?

Mr. ALLISON. Yes; tentatively in Maine.

The reason for the State of Maine is the result of a variety of assessments that we did in the South, the Southeast, and the Northwest, the Midwest, and the Northeast. We finally concluded that from the standpoint of near-term commercialization, primarily because of the very hard costs of electrical power, particularly in the Northeast, that for creating the model and a benchmark facility on high, so to speak, the facility from a commercialization and economic viability standpoint, we thought it would be best located in Maine. On that basis, the Department of Energy agreed with our assessment and directed that our activities be focused in Maine.

In approximately 10 months we will be finished with that study. That package will be one that is available for the public from the standpoint of anyone wishing to design, construct, own, and operate a 50-megawatt electrical power generating facility anyplace in the United States.

Mr. WEAVER. Would you describe how it works?

Mr. MILLIGAN. In general, in our study we will develop a system to harvest, collect, and transport the biomass to a conversion facility.

The feature of cogeneration that we have selected those areas whereby we may site ourselves contiguous with a large process steam user. The economics, of course, are better in the cogeneration feature and mode than they are in the straight electrical generation mode.

Digitized by Google

We will devise a system to transport the fuel to the conversion facility. The conversion facility itself will utilize the technology that has been developed. We have talked about that a great deal this morning. The pulp and paper industry has been a leader in the use of wood waste.

Mr. WEAVER. Are you talking about the pryolysis?

Mr. MILLIGAN. No; this is straight combustion.

The whole objective is to use the technology that has been proven. We are going to demonstrate mainly the feature of gathering the biomass to prove its viability economically.

Of course, we will use the technology that we have developed in the burning of this material. Of course, it has been proven in a number of instances.

Mr. WEAVER. What particular things will be included in the biomass?

Mr. MILLIGAN. Our studies are leaning toward the forestry, harvesting, and mill waste and those unmerchantable types of species of growth that are dying in the forests.

Mr. WEAVER. Nothing else? All wood?

Mr. MILLIGAN. Yes; all wood.

Of course, from the combustion of the wood, we will, of course, use the normal technology for the generation of electricity.

Mr. WEAVER. Who are you cogenerating with in Maine.

Mr. MILLIGAN. At this particular time we have not made that decision. We have looked at a number of sites and are trying to zero in on this. We are looking at economics as we go.

Mr. ALLISON. I will conclude with this. We support the objectives of your bill, Mr. Chairman. It relates to what we call biomass cogeneration projects. We see substantial reasons and justifications for utilizing some of the resources that are currently being wasted from the standpoint of converting them into energy.

As a standing model, so to speak, of the kind of facility that we anticipate applying, we again would invite you to the Saugus facility and give you a 1-on-1 measure of exactly what we expect to do and expect to be able to accomplish, literally across the Nation with biomass cogeneration facilities.

We thank you for the opportunity to be here today.

Mr. WEAVER. I want to strongly compliment Wheelabrator for this endeavor. I like to see a corporation that is not only trying to make some money, but that is doing it in a way that I think in the long run is the right way and will benefit the Nation the most. I just cannot commend you more for what you are doing.

They will learn about this through my hearings in the Northwest. We will spread the word around and see if we can get you some business.

Thank you very much for coming.

Mr. ALLISON. We thank you.

[The prepared statement submitted by Mr. Allison follows:]

Digitized by Google

GARY L. ALLISON
Senior Vice President

Wheelabrator Cleanfuel Corporation
Suite 1100
1050 17 Street, N.W.
Washington, D.C. 20006
Tel. (202) 296-5173

TESTIMONY PRESENTED BY
GARY L. ALLISON
SENIOR VICE PRESIDENT
WHEELABRATOR CLEANFUEL CORPORATION

Mr. Chairman, and Members of the Subcommittee, my name is Gary Allison. I am Senior Vice President of Wheelabrator Cleanfuel Corporation (WCC), which is a subsidiary of Wheelabrator-Frye, Incorporated (WFI). Thank you for this opportunity to appear before you today.

Our parent company, Wheelabrator-Frye, Incorporated, is a publicly-owned corporation, incorporated in the State of Delaware, with stock traded on the New York Stock Exchange. WFI is a recognized world leader in the design, construction and operation of environmental and energy systems. As a company, we are deeply committed to the development of energy sources other than oil and natural gas and to the preservation of environmental quality.

Our interest in the conversion of various forms of biomass to synthetic fuels and other useful forms of energy is a result of our successful work in the processing of urban waste to steam and electricity in a facility which Wheelabrator-

Digitized by Google

Frye engineered, constructed and financed and a subsidiary, Refuse Energy Systems Company (RESCO), now operates in Saugus, Massachusetts on Boston's North Shore. The Saugus facility, which has been operating since 1976, processes more than 1,000 tons per day of garbage. This facility is and has been operating successfully and displacing the equivalent of 15 million gallons of oil per year.

We believe the Saugus, Massachusetts, plant demonstrates that the energy needs of our Nation can be partially met by utilization of what has heretofore been considered waste materials. The Department of Energy has recently awarded WCC the first (design and specification) phase of what is anticipated to be a three-phase program that will result in the construction and operation of a stand-alone facility that will convert forest residues and other wood waste materials to process steam and electric power. In phase I, WCC is designing, economically characterizing, and environmentally assessing a large scale -- 1,000 oven-dry tons per day input, 30-MW electricity and steam output -- biomass energy conversion facility.

The Phase I contract currently under way is for $2.5 million. Phases II and III (construction and operation) are estimated to cost approximately $60 million. Our investigation and projections to date indicate that when the plant is in operation, the cost of the electricity and steam produced will

Digitized by Google

be competitive with the costs of energy from other sources. Preliminary estimates indicate that a biomass-fueled power plant, started in Fiscal Year 1978, should generate electrical power for 48 to 55 mils per kilowatt hour in 1982. For the sake of comparison, it is forecasted that by 1985, consumer power costs in New England will reach nearly 70 mils per kilowatt hour.

The main objective of the DOE/WCC biomass program is to demonstrate that significant amounts of energy can be obtained at competitive prices through the harvesting, collection, and combustion of biomass to produce steam and electric power. The production of both electrical power and steam -- cogeneration -- is seen as the most efficient method of providing power to utilities and steam to industrial complexes.

Within the scope of the first phase of the program, studies are being conducted to characterize long-term availability, harvesting, collection, processing and transportation of biomass to a conventional combustion conversion facility. The environmental and demographic implications of all facets of the program, from fuel procurement to power production, are also being assessed.

From these analyses, a final design will technically and economically specify the proposed demonstration plant. The purpose is to establish the commercial viability of using this alternative energy source.

Digitized by Google

When constructed, the demonstration plant will convert 1,000 oven-dry tons of biomass per day to energy. The conversion at 60% efficiency will produce 8 billion Btu's per day.

The energy produced will be enough to provide electricity for a community of about 27,000 homes. Additionally, about 200,000 pounds per hour of process steam for industrial applications will be generated. This will reduce the oil consumption of a typical industrial complex by about 36 million gallons per year. This demonstration facility is intended to provide a baseline model which can be duplicated throughout the country.

A key element in the success of this type of facility is the availability of long-term fuel supplies and their procurement economics.

Our analysis has provided convincing evidence that biomass-fueled power plants can be built and operated on a permanent basis in many areas of the country. A great many well-forested regions can readily support comparable 1,000 ton/day biomass-fueled power plants. Furthermore, our studies show that these power plants can be operated upon waste wood alone; that is, species with no commercial value, dead and diseased trees, culls and thinnings, or other commercial waste including tops and limbs of trees and bark residues.

Digitized by Google

An area considerably smaller than that encompassed within a 50-mile radius can support a 1,000 ton/day plant if a substantial amount of industrial residue is available -- lumber mill wastes such as slabs, trimmings, sawdust, bark and so forth that presently poses a disposal problem.

The U. S. Forest Service has concluded that there are approximately 1.3 billion tons of rough and rotten dead or trash wood standing in the forest today, available for conversion to energy. In addition, more than 500 million tons of logging residues are generated each year. An article published in Business Week, March 15, 1976, entitled "Power Plants Turn to Good Old Wood", noted that a study completed for the Environmental Protection Agency by Battelle Memorial Institute, concluded that "nearly three-quarters of the wood harvested each year is lost somewhere on the trail from the forest to end products". According to the study, this waste alone contains enough energy to replace 21% of the total fossil fuels -- including oil and gas -- consumed each year by U. S. utilities. In some areas of the country, such as the Northwest, there is as much energy available from waste wood as there is from all the fossil fuels burned by the utilities.

There is enough waste biomass to theoretically support 1,500 electrical generating plants that could produce

Digitized by Google

50 megawatts of power each. This would supply power for about 50 million homes and reduce our dependency on imported oil by some 1.6 billion barrels yearly.

The study which we have underway will determine whether a sufficient amount of these forest residues can be harvested and collected for delivery to a conversion site at a competitive price. We know sufficient waste material exists on a day-to-day, year-to-year basis. The question is at what cost is this fuel available? For comparison purposes, the pulp and paper industry can afford to pay $35 per ton for wood resources, a biomass conversion facility can afford to pay only $16 per ton for the wood residue used. This means that adequate supplies of wood must be carefully identified and cost-effective harvesting and collection systems applied. With regard to the latter, harvesting/collection equipment and systems are vital in order that optimum use be made of advances in technology and to be certain both that biomass material is available at the lowest possible cost and that the environment is fully protected. We believe that the method of harvesting, collection and transportation of biomass will be the major factor in determining the economics of a biomass facility. Wheelabrator studies, to date, indicate that modern highly mechanized equipment is available to develop a system that would provide collection at a price competitive to the price of oil projected to 1982.

Digitized by Google

As part of this on-going investigation, we have visited with the Swedish forest industry. They are utilizing their forest resources in a much more optimum manner than is currently prevalent here. The Swedes have taken an extremely conservative view of forest residues which might be available for energy purposes, and they still project that they can reduce their dependency on oil by seven percent (7%) through the use of wood residues. This Country's potential for reducing dependency on imported oil through the use of biomass residue will be even greater than Sweden's due to the larger biomass resources.

Our study will determine the most efficient and economic method for getting this material to a conversion facility. Based on our present findings, we believe that the cost to convert wood to steam will be approximately $2.35 per million Btu's, as compared to $2.50 per million Btu's for oil. This cost is predicated upon a mechanized system of harvesting and collection utilizing skilled tradesmen as operators. Also, the recovery of the biomass may be done in conjunction with existing operations during the harvesting of the timber to be used by the pulp and paper industry, sawmills, and the wood products industry.

The economics of harvesting and collecting the forest residues suitable for a biomass facility depend upon various factors, including:

Digitized by Google

1. Volume by acre to be obtained;
2. Size of tract to be harvested;
3. Accessibility, including terrain and distance to the plant utilizing the material;
4. Price to be paid for the material.

I think it is fairly obvious from this discussion that even though the entire bioconversion facility will be designed using state-of-the-art technology known in industry today, there are questions of great importance which must be answered before industry will attempt to construct these facilities without government assistance. It should be noted that (1) while the pieces may exist, complete systems from harvesting to production of energy have yet to be put together; (2) the regulatory and institutional implications of integrating the power produced into an electric utility grid are not clear; (3) the economics of constructing and operating a small 40 to 50 MWe power plant by a non-utility are not known.

Our cost-shared project with the government is designed specifically to answer these and other questions. Wheelabrator Cleanfuel has chosen the State of Maine for the siting of the biomass demonstration facility. Maine is typical of those areas of high-density forest lands that exist in the Northwest, South and Southeast. In addition,

33-770 O - 78 - 6

Digitized by Google

Maine is at the end of everyone's fossil fuel pipelines -- it has no indigenous fossil fuels and the State's energy costs are relatively high.

To be more specific, the State of Maine consists of 90% forest land. There are 17 million acres of commercial forests that are 60% fully stocked. We have determined that there are more than a dozen sites in Maine that could provide the fuel necessary to power the plant that is scheduled to be built for this project. Based on estimates of 3.8 cords per acre of rough and rotten wood and requirements of 315,500 cords annually, there is in excess of 19 years' waste wood standing today within the 50-mile radius of the dozen sites. This assessment does not include harvesting any of the growing and merchantable timber on these lands, nor any of the annual growth, nor does it include any of the waste that results from the harvesting of marketable timber.

With respect to the actual operation of a conversion facility, we now anticipate that the power plant site will consist of a 90-day biomass storage yard with automated unloading, storage and reclaim-material-handling systems, a biomass-fired boiler and turbine generator, and an electrical power distribution system and switch yard with necessary utilities.

The heart of the conversion unit is the wood-burning boiler. Large numbers of these units are in operation today.

Digitized by Google

The boiler itself will be the largest wood-fired unit available -- capable of producing 500,000 pounds per hour of high-grade steam. That steam is piped to the turbine-generator complex to produce net power for the utility grid (30 MW) with about 200,000 pounds of steam per hour tapped off the turbine for export.

Finally, the results of environmental harvesting leave the forest in a more productive and aesthetically pleasing state. Biomass harvesting provides environmentally sound conditions for healthy growth of commercially-valuable timber through the selective removal of unmarketable trees. This process eliminates trees that have been absorbing the sunlight and draining the soil of necessary nutrients, thus providing for healthy new growth of more marketable trees. Our studies show that removing dead trees, thinning out culls and over-mature growth, and other beneficial forestry practices have definite advantages in promoting healthy growth, increasing yields per acre by a factor of 2 or 3, and reducing forest fire hazards.

In certain areas, such as New England, where there are large stands of low quality hardwoods, harvesting forest residues may take place in some cases making economic the harvesting of small amounts of timber in otherwise unmerchantable stands. Removal of forest residues will not only increase the utilization of the resource, but in some cases will have beneficial effects on reducing landfills, forest residue burning, and improve the esthetics of forest operations. Silviculturally,

Digitized by Google

the creation of a market for low quality cull material and thinnings can increase the financial incentive for timber stand improvement, especially for small landowners. Additionally, it should be noted that working in cooperation with existing forest operations will mean that there will be no significant increase in logging operations, such as building roads and landings, and, consequently, will probably have little additional impact on water quality, wildlife, and the surrounding environment. Therefore, one of the greatest benefits of a bioconversion facility is that the utilization of the economical, available residue will be a forest management and silvicultural tool.

Wheelabrator believes that the conversion of wood waste and forest residues to energy offers a significant opportunity to contribute to our energy supplies while at the same time benefitting our country's forests. We are, therefore, especially supportive of the objectives which are sought to be achieved in H.R. 13324, a bill introduced by Congressman Weaver. The proposal would establish pilot projects for testing and demonstrating practical application of existing technology for the utilization of wood residues from timber harvesting, forest protection and management, and the manufacture of wood products. While one of the objectives of the bill, as defined in Section 2, is to "develop alternative sources of energy", it would appear that such objective could be made

Digitized by Google

more explicit throughout the bill and that, in addition, some reference should be made in the bill to define the means and mechanisms for cooperation and coordination between the Department of Agriculture and the Department of Energy.

Mr. Chairman, we want to again thank you for this opportunity to appear before this Subcommittee. Wheelabrator-Frye endorses the efforts made by your Committee to place greater emphasis upon the biomass to energy program as a means by which this Nation might fully develop more of its potential energy resources. Our project in Maine, if successful -- and we have every reason to believe that it will be successful -- will go far toward demonstrating that clean energy can be produced from a waste residue while, at the same time, cleaning up and enhancing the forest environment.

Digitized by Google

Mr. WEAVER. We will call at this time Mr. Joe McGrath, vice president for government affairs, National Forest Products Association.

We welcome you and we look forward to hearing your testimony today.

Mr. MCGRATH. Thank you, Mr. Chairman.

I am Joseph B. McGrath, vice president of government affairs of the National Forest Products Association. I have with me today Dr. John Muench. Dr. Muench is director of economics for the forest products industry, and he is also the staff executive for all energy matters which the NFPA handles.

I have a prepared statement which I would like to submit for the record.

Mr. WEAVER. Without objection, it is so ordered.

[The prepared statement and attachment thereto submitted by Mr. McGrath follows:]

Digitized by Google

NATIONAL FOREST PRODUCTS ASSOCIATION
1619 Massachusetts Avenue, N. W., Washington, D. C. 20036

STATEMENT OF
JOSEPH B. McGRATH
OF THE
NATIONAL FOREST PRODUCTS ASSOCIATION
BEFORE THE
SUBCOMMITTEE ON FORESTS
OF THE
HOUSE AGRICULTURE COMMITTEE
AUGUST 8, 1978
ON H.R. 13324

Chairman Weaver and Members of the Subcommittee:

I am Joseph B. McGrath, Vice President, Government Affairs for the National Forest Products Association. Headquartered in Washington, D.C., NFPA is a federation of twenty-six member associations and direct corporate members. We represent growers, producers, and manufacturers of solid wood products in the United States. We welcome the opportunity to appear before this subcommittee to present our views on H.R. 13324, a bill to establish projects for testing and demonstrating methods of utilizing wood residues.

I would like to say at the outset that we support the objectives of this bill. We agree that we must actively seek new ways to utilize wood residues and other by-products of the timber harvesting and manufacturing process. Your introductory remarks on this legislation were right on target when you pointed out that wood residues can provide a number of useable products and benefits. Unmerchantable logs and timber left at the harvesting site often contain sound, chippable wood which, under favorable economic conditions, can be converted to energy or other products.

Digitized by Google

There is, however, a problem with respect to the need for this legislation. Both the Forest Service and the Department of Energy have ample authority to carry out projects to increase utilization of wood by-products. There is already an interagency team involving the Forest Service and the Department of Energy in coordinating the development of research on this issue. Existing program authorities and appropriations should be fully utilized before additional authority and funding are approved.

Great progress has been made during the past decade in utilizing wood residues. Less than ten years ago, burning sawdust, slabs and edgings at the sawmill site was a common practice. Bark was often trucked away to a land fill. Timber of low grade and undesirable species was routinely left standing in the woods, creating both a silvicultural and aesthetic problem. This situation has changed remarkably.

Slabs and edgings are now chipped and made into paper, and sawdust is used as an energy source. Bark is now routinely burned for energy, and many paper mills generate as much as 45 percent of their energy needs through utilizing waste wood. Timber of otherwise undesirable species and low quality is, in many cases today, removed from the woods and chipped to make paper or particleboard. Gone are the days of the teepee burner at the mill site.

While much progress has been made, we should point out, however, that utilization of wood residues for energy or any other purpose requires an adequate and certain flow of the raw material. This has not been the case on the National Forests. As you know, the future

Digitized by Google

of timber supply from the National Forests is uncertain in view of RARE II and other demands which tend to withdraw commercial forest land from wood production. To develop technology to use more and more wood residues for energy will be of limited usefulness if the raw material is not available.

Again, we urge both Congress and the Administration to recognize and to implement the goals of the Resources Planning Act (RPA). The hearings by this subcommittee on RPA implementation, and the support of Chairman Weaver, are major steps in the right direction. The potential demand for wood as an energy source underscores the importance of achieving this long-range management plan for the National Forests.

A PERMANENT SOLUTION

Rather than establish single purpose programs, as in H.R. 13324, to direct federal agencies to undertake studies for which there is already authorization, perhaps the Committee should consider creation of a new vehicle to accomplish the objectives. We would support a permanent Office of Timber Growth and Utilization within the Department of Agriculture. Its purpose would be to assure the application of existing and developing technology to timber growing, harvesting, transportation, manufacture and use, including greater utilization of wood residues.

Millions of dollars are now being invested annually by federal agencies and academic organizations in forestry, timber harvesting, conversion and utilization research. This extensive research should be producing greater benefits through practical technology transfer.

Digitized by Google

One of the factors impeding technology transfer is the fragmented ownership of 56% of total commercial forest land in the U.S. Another is the large number of small and medium size companies that account for a major portion of wood production in many product lines. The economic characteristics of the relatively small ownership or enterprise impede investment in, and use of any new technology.

Most proposals, including H.R. 13324, for correcting the technology transfer problem in the forest industry call for Government to become directly involved in demonstration programs and in pilot plant construction and operation. However, without industry or owner participation, such efforts lack economic credibility. They lead to creation of inflated programs that continue long after original purposes have been fulfilled and generally fail to stimulate investment by the private sector.

Establishment of an Office of Timber Growth and Utilization Research in the Department of Agriculture would provide a level of technology transfer that is appropriate to meet anticipated future demand on timber resources. It would also provide a greater payout from publicly funded forestry, process and product research, and avoid costly, unproductive government programs. The mission and structure of the proposed Office could be patterned after those of the Department of Interior's Office of Coal Research, particularly the use of government funded or shared risk process and product development contracts as a means of encouraging industrial participation.

Three years ago, a bill was drafted to create an Office of Timber Growth and Utilization Research. I am attaching a copy of this draft legislation to my statement, and I urge this subcommittee to give the alternative serious consideration.

We look forward to working with you as this legislation progresses, and we are confident that through our combined efforts, advances in the technology of using wood residues will continue. Thank you for the opportunity to testify.

Digitized by Google

August 7, 1978

A PROPOSED BILL

To encourage and facilitate the commercial development and implementation of more efficient and environmentally sound methods of growing, harvesting, converting, and utilizing wood products by authorizing the Secretary of Agriculture to contract for applications research in forestry practices, timber processing and wood utilization, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

That this Act may be cited as the "Office of Timber Growth and Utilization Act of 1978".

FINDINGS AND PURPOSE

Section 1. The Congress finds that - -

(a) If housing and other wood products and wood fiber needs in the next decade and beyond are to be met, timber growth and harvest on public and private non-industrial forest lands must be increased consistent with environmentally sound principles of forest management, and the total available timber supply must be extended through more efficient usage;

(b) The transfer of new technology from timber and forest products research into commercial usage is a key element in achieving a reasonable balance between future public demand for wood and available timber resources, and

(c) Existing government and private institutional mechanisms

Digitized by Google

for the transfer of basic timber growth, harvest and utilization research to practical commercial application are inadequate to meet the growing need for more efficient timber utilization and an increased timber supply.

Section 2. It is the purpose of this Act to provide for the establishment of an "Office of Timber Growth and Utilization Research" within the Department of Agriculture to encourage and facilitate commercial development and implementation of more efficient and environmentally sound methods of growing, harvesting, converting, and utilizing wood products.

OFFICE OF TIMBER GROWTH AND UTILIZATION RESEARCH

Section 3. The Secretary shall establish within the Department of Agriculture an Office of Timber Growth and Utilization Research (hereinafter referred to as the "Office") and through such Office shall,

(1) Contract for, sponsor, co-sponsor and promote the coordination of application and development programs, including design, construction and operation of pilot process projects and economic feasibility demonstrations concerned with the following - -

(a) planting, protection, and nourishment of forests;

(b) tree harvesting, including thinning, felling, ecological impacts and forest residues;

(c) conversion of trees into useful products, including sawmilling, peeling, drying, gluing, pressing and mechanical and chemical fiber making;

Digitized by Google

(d) increased utilization of wood residues resulting from timber harvesting, forest protection and management and the manufacture of wood products, including wood pulp; and

(e) improved efficiency of wood use including protection, systems design and innovation, recycling and waste conversion, reduction of wildfire hazards; and improved transportation and sorting of wood residues;

(2) Encourage and, when necessary and appropriate, contract for or otherwise sponsor and co-sponsor research to fill gaps in supporting technologies which impede commercial development or implementation of forestry and wood research;

(3) Promote the coordination of federal, state and private forestry and wood utilization research; and

(4) Establish a technical advisory committee composed of recognized leaders in the forest products industry, in the forestry profession and in federal and state government and educational institutions (a) to assist in the identification of problem areas, establishment of priorities and evaluation of research progress and of all research proposals and contracts, and (b) to assure avoidance of duplication in research.

Section 4. (a). The Office shall encourage and support forestry and wood utilization research conducted or funded by the Forest Service, by the Cooperative State Research Service, by the National Science Foundation, by the National Institute of Building Sciences and by state governments, educational institutions and

Digitized by Google

other organizations, including other agencies and departments of the United States. In accomplishing this objective, the Office shall be concerned primarily with the transference of such forestry and wood research into widespread commercial usage. The Office shall, in cooperation with the Department of Energy, give special attention to developing alternative sources of energy through wood utilization research.

(b) The Office shall give special attention and emphasis to those practices, processes and product development projects which promise benefits of a general nature but as to which implementation is otherwise inhibited or unlikely because of the high risks and costs in terms of the resources and capabilities of potential users. The design, construction and operation of pilot demonstrations, pilot process projects, pilot plants, economic feasibility demonstrations, test marketing and projects of a similar nature shall be done only by private sector, non-governmental contractors.

Section 5. The Secretary may appoint a Director of the Office of Timber Growth and Utilization Research without regard to the provisions of Title 5, United States Code, governing appointments in the competitive service and without regard to the provisions of Chapter 51 and Subchapter III of Chapter 53 of such title relating to classification and General Schedule pay rates.

AVAILABILITY OF RESULTS

Section 6(a). All information, uses, products, processes, patents,

Digitized by Google

and other developments resulting from the activities of the Office shall be made available to the public with such exceptions and limitations, if any, as the Secretary may find necessary and appropriate.

(b) Whenever in the estimation of the Secretary the purposes of this Act would be furthered through the use of patented processes or equipment, the Secretary is authorized to enter into such agreements as he deems necessary for the aquisition or use of such patents or equipment on reasonable terms and conditions.

(c) Licenses to patents or patented processes resulting from research contracts that are funded solely by the Office shall be made available to the public without the imposition of royalties or other fees except for reasonable costs of administration. Any royalties or other income derived from licenses or patents or patented processes resulting from research contracts funded on a shared-risk basis shall be divided between the Office and the co-sponsor in proportion to their respective contributions.

Section 7. The Secretary shall make brief annual reports to the House Committee on Agriculture and the the Senate Committee on Agriculture, Nutrition, and Forestry on the accomplishments of the pilot projects authorized by this Act. The first such report shall be submitted at the time of submission of the annual fiscal budget, after the first full year of implementation of this Act.

Digitized by Google

DEFINITIONS

Section 8. As used in this Act, the term - -

(a) "Secretary" means the Secretary of Agriculture;

(b) "Office" means the Office of Timber Growth and Utilization Research, and

(c) "Research" means scientific, technical, and economic research, and the practical application of that research.

APPROPRIATIONS

Section 9(a). There is hereby authorized to be appropriated not more than $1,000,000 to be used to carry out the purpose of this Act for the fiscal year beginning October 1, 1979.

(b) There are hereby authorized to be appropriated for each fiscal year beginning after September 30, 1980, such sums as may be necessary to carry out the purposes of this Act.

(c) Sums appropriated to carry out the purpose of this Act shall remain available until expended.

Section 10. This Act shall become effective October 1, 1979.

* * * * * * * * * * * * * * * * *

Digitized by Google

Mr. McGrath. I urge the subcommittee to give the alternative some serious consideration. It was given serious consideration by the administration in 1974 when the decision was made then not to pursue the matter because of budget constraints. I would like to submit for the record a copy of the letter that was sent to us to this effect from Assistant Secretary Long dated October 25, 1974, together with a background memorandum from NFPA staff files giving details as to the development of the proposal, the position of the Forest Service, and the Department of Agriculture at that time.

I have a copy of that attachment which I would like to submit for the record.

In addition, I would like to submit for the record a copy of Public Law 86–599 which was enacted July 7, 1960, and which established a very successful Office of Coal Research, really technology transfer in the Department of the Interior. I have labeled that attachment C.

Our view is that there is an analogy, a genuine analogy between the coal industry and the forest products industry. They are both raw material oriented. They are commodity directed. They are fragmented. They are dependent to a large extent on Government or tax-supported technical or research centers of services. There is some in the testimony this morning gave evidence to, I believe.

I thought the testimony of Mr. Resler of the Forest Service illustrated that point very clearly.

I would like to submit also for the record a resolution which was approved by NFPA at its Board of Directors' meeting in 1974, supporting the establishment of an Office of Timber Growth and Utilization. I have labeled this attachment D.

Mr. Weaver. Without objection, the attachments will be inserted into the record at this point.

[The attachments submitted by Mr. McGrath follows:]

33-770 O - 78 - 7

Digitized by Google

ATTACHMENT B, NOVEMBER 1974

OFFICE OF TIMBER GROWTH AND UTILIZATION RESEARCH

- Development of Proposal in NFPA
- Position of Forest Service and Department of Agriculture

In November 1973, the Subcommittee on Technical Studies concluded that utilization and implementation of forest products research results were inadequate relative to anticipated demands on available timber resources and that early involvement of industry in feasibility, marketing and pilot plant programs was essential if improvement in technology transfer were to be realized. A resolution was approved by the NFPA Board of Directors authorizing NFPA to meet with governmental agencies to investigate the feasibility of establishing an Office of Timber Growth and Utilization Research within the Department of Agriculture to administer technology transfer programs comparable to that of the Department of Interior's Office of Coal Research.

Following discussion with officials from the Office of Coal Research, the Forest Service and Assistant Secretary of Agriculture Robert Long, the Subcommittee on Technical Studies recommended to the Committee on Codes and Product Acceptance that NFPA be authorized to seek establishment of an Office of Timber Growth and Utilization Research to "encourage and facilitate commercial development and implementation of more efficient and environmentally sound methods of growing, harvesting, converting and using wood products." This recommendation was approved by the NFPA Board at the May 1974 meeting.

In July and August, NFPA staff held a series of meetings with Messrs. Dickerman, Youngs and Zerbe of the Forest Service to further discuss the background of the proposal and how it might be implemented. Mr. Dickerman advised that the Forest Service was in agreement with the finding that commercial usage of government funded forest products research was inadequate and that a new mechanism was needed to facilitate technology transfer. He further indicated that the Forest Service would prepare a proposal for creation of a new Office of Timber Growth and Utilization Research for possible inclusion in the Forest Service's 1976 request for appropriations.

Technical Studies Subcommittee member, Dale Turner, and NFPA staff met with Messrs. Youngs and Zerbe in September to explain and

Digitized by Google

emphasize why the Office of Coal Research approach providing direct early involvement of industry through government funded or shared risk process and product development contracts was prerequisite to successful technology transfer in the forest products industry. Mr. Youngs indicated general agreement with the views expressed.

Forest Service officials presented their proposal for creating the Office to Assistant Secretary Long in October. The proposal included evaluation of the advantages and disadvantages of four alternate organizational locations for the Office; (1) reporting directly to the Assistant Secretary, (2) attached to the Department of Agriculture's Cooperative States Research Service, (3) reporting to the Chief of the Forest Service, or (4) attached to the Forest Service's present research division. It was reported that the proposal included a $5 million budget authorization to start the new office.

However, the Department of Agriculture has decided not to propose creation of the Office in FY 1976. Assistant Secretary Long wrote to NFPA Executive Vice President Ralph Hodges on October 25 advising that while an adequately funded and administered Office of Timber Growth and Utilization Research would be beneficial, the need to limit government spending precluded advancing such a major new initiative at this time. Copy of Secretary Long's letter is attached as Exhibit A.

Digitized by Google

EXHIBIT B

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20250

October 25, 1974

Mr. Ralph Hodges
Executive Vice President
National Forest Products Association
1619 Massachusetts Ave., N.W.
Washington, D.C. 20036

Dear Ralph:

Some time ago when we discussed your proposal for an Office of Timber Growth and Utilization Research, I agreed to explore the possibilities for establishing it within USDA.

The overall concept of an Office of Timber Growth and Utilization Research is interesting to me. Such an Office, adequately funded and well administered, would promote implementation of research results and help solve many of the problems the forest products industry and the Nation as a whole are facing. However, we are concerned with the timing for such a proposal. With the current need to limit Government spending, advancing such a major new initiative now seems inadvisable.

We will be pleased to consider the proposal at a more appropriate time.

Sincerely,

Signed

ROBERT W. LONG
Assistant Secretary

Digitized by Google

ATTACHMENT C

PUBLIC LAW 86-599

86th Congress, H.R. 3375

AN ACT July 7, 1960 74 Stat. 336

To encourage and stimulate the production and conservation of coal in the United States through research and development by authorizing the Secretary of the Interior to contract for coal research, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That as used in this Act—

(a) The term "Secretary" means the Secretary of the Interior.

(b) The term "research" means scientific, technical, and economic research and the practical application of that research.

Office of Coal Research, establishment

Sec. 2 The Secretary shall establish within the Department of the Interior an Office of Coal Research, and through such Office shall—

(1) develop through research, new and more efficient methods of mining, preparing, and utilizing coal;

(2) contract for, sponsor, cosponsor, and promote the coordination of, research with recognized interested groups, including but not limited to, coal trade associations, coal research associations, educational institutions, and agencies of States and political subdivisions of States;

(3) establish technical advisory committees composed of recognized experts in various aspects of coal research to assist in the examination and evaluation of research progress and of all research proposals and contracts and to insure the avoidance of duplication of research; and

(4) cooperate to the fullest extent possible with other departments, agencies, and independent establishments of the Federal Government and with State governments, and with all other interested agencies, governmental and nongovernmental.

Advisory committees, procedures.

Sec. 3 (a) Any advisory committee appointed under the provisions of this Act shall keep minutes of each meeting, which shall contain as a minimum (1) the name of each person attending such meeting, (2) a copy of the agenda, and (3) a record of all votes or polls taken during the meeting.

(b) A copy of any such minutes or of any report made by any such committee after final action has been taken thereon by the Secretary shall be available to the public upon request and payment of the cost of furnishing such copy.

Compensation
60 Stat. 808

(c) Members of any advisory committee appointed from private life under authority of this section shall each receive $50 per diem when engaged in the actual performance of their duties as a member of such advisory committee. Such members shall also be entitled to travel expenses and per diem in lieu of subsistence at the rates authorized by section 5 of the Administrative Expenses Act of 1946 (5 U.S.C. 73b-2) for all persons employed intermittently as consultants or experts receiving compensation on a per diem basis.

(d) Service by an individual as a member of such an advisory committee shall not subject him to the provisions of section 1914 of title 18 of the United States Code, or, except with respect to a particular matter which involves the Office of Coal Research or in which the Office of Coal Research is directly interested, to the provisions of sections 281, 283, or 284 of that title or of section 190 of the Revised Statutes (5 U.S.C. 99).

Coal Research, Director
5 USC 1071 notes
70 Stat. 739

Sec. 4. The Secretary may appoint a Director of Coal Research without regard to the provisions of the civil service laws, or the Classification Act of 1949, as amended. Section 107(a) of the Federal Executive Pay Act, as amended (5 U.S.C. 2206(a)), which prescribes an annual rate of basic compensation of $17,500 for certain positions, is amended by adding at the end thereof the following paragraph:

"(23) Director of Coal Research, Department of the Interior."

Sec. 5. Research authorized by this Act may be conducted whenever suitable personnel and facilities are available.

Sec. 6. No research shall be carried out, contracted for, sponsored, cosponsored, or authorized under authority of this Act, unless all information, uses, products, processes, patents, and other developments resulting from such research will (with such exceptions and limitations, if any, as the Secretary may find to be necessary in the interest of national defense) be available to the general public. Whenever in the estimation of the Secretary the purposes of this Act would be furthered through the use of patented processes or equipment, the Secretary is authorized to enter into such agreements as he deems necessary for the acquisition or use of such patents on reasonable terms and conditions.

Report to President and Congress

Sec. 7. The Secretary shall submit to the President and the Congress, on or before February 15 of each year, beginning with the year 1961, a comprehensive report concerning activities under the authority of this Act, including information on all research projects conducted, sponsored, or cosponsored under the authority of this Act during the preceding year.

Appropriations

Sec. 8. (a) There is hereby authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, to remain available until expended, not to exceed $2,000,000 to be used to carry out the purposes of this Act for the fiscal year beginning July 1, 1960.

(b) There are hereby authorized to be appropriated for each fiscal year beginning after June 30, 1961, such sums as may be necessary to carry out the purposes of this Act.

(c) Sums appropriated to carry out the purposes of this Act shall remain available until expended.

Approved July 7, 1960.

Digitized by Google

ATTACHMENT D, MAY 1974

National Forest Products Association

BOARD OF DIRECTORS

Resolution 74A 1

The Committee on Codes and Product Acceptance recommends that the Board of Directors adopt the following resolution:

"The National Forest Products Association is authorized to seek establishment of an Office of Timber Growth and Utilization Research in the Department of Agriculture to encourage and facilitate commercial development and implementation of more efficient and environmentally sound methods of growing, harvesting, converting and using wood products. The Office shall:

"(1) Sponsor application and development programs, including pilot plant and pilot process projects and economic feasibility demonstrations concerned with the

- planting, protection and nourishment of forests,
- tree harvesting, including thinning, felling, ecological impacts and forest residues,

Digitized by Google

- manufacture of products including sawmilling, peeling, drying, gluing, pressing and mechanical and chemical fiber making, and
- improving efficiency of wood use, including protection, system design and innovation, recycling and waste conversion.

(2) Encourage, and if necessary, sponsor research to fill gaps in supporting technology which impede commercial development or implementation.

(3) Promote coordination of federal, state and private forestry and wood research.

(4) Establish a general technical advisory committee consisting of recognized leaders in industry, government and education institutions to assist in identification of problem areas, assignment of priorities and examination of research progress.

(5) Contract with the private sector for design, construction and operation of pilot demonstrations, pilot plants and test marketing programs, and

(6) Jointly fund ventures with the participating company or companies on the basis of the technical and marketing risks involved."

Digitized by Google

Mr. McGrath. You might be interested to know, Mr. Chairman, that later on the board after receiving Assistant Secretary Long's letter advising that the administration because of budget constraints could not proceed at that time with the proposal—it never did send it to the Congress—that we were authorized to support and investigate proposals for achieving the legislative objectives of that office. That is the office that is described in the attachment to my statement.

I would really urge that you and the subcommittee staff take a look at our suggestions and see whether or not it is possible to expand H.R. 13324 so as to incorporate our recommendations. There is a real parallel, as I have noted in the language in your bill, which I think is very well drafted, with some of the language which we developed 4 years ago. It would not be difficult, as I look at it, to take some of our suggestions and expand what you already have and end up with a permanent vehicle for technology transfer.

We look forward to working with you on the legislation. We will help, if we can, with the field hearings. We are confident that through the combined efforts, perhaps, that advances in technology of using wood residues would continue and we appreciate this chance to testify before you.

Mr. Weaver. Thank you very much, Mr. McGrath. You have made an interesting proposal. We certainly will consider it and will be glad to work with you on it.

The previous testimony implied the possibility of changing harvest systems might be essential in utilizing to the fullest extent the wood residues in our forests.

I have often noted as I flew over my forests that I could tell almost the year in which the harvest was made, depending on how much residue was left. In some cases, depending on the market several years ago, they just left huge logs out in the forests. Then, in the years when the pulp market was very high, every scrap was picked up.

In your testimony I think you are changing your harvest system. Would you comment on that? Do you think the forest industry needs to possibly alter its harvest systems in such a way as to further utilize everything in the woods?

Mr. McGrath. Yes; I will ask Dr. Muench to comment if that is all right.

I would say, first, that there is certainly an effort and a desire on the part of the timber industry both in private lands as well as public lands to do this. There have been changes in Forest Service practices which have assisted in the withdrawal from the woods in a timber harvesting process of more materials than formerly done.

I think that the introduction of new machinery and the development of markets which have increased the value of wood fiber as wood fiber, as opposed to lumber, and so on, have caused companies to make every effort they possibly can to withdraw material from the woods consistent with the objective of being able to do it in an economic fashion. Perhaps Dr. Muench could supplement what I have said.

Mr. Muench. I would agree with Mr. McGrath. I would also point out the increased value of the wood fiber both in energy and in the export market as you are familiar with from the west coast States to Japan. A good market for wood chips has developed there.

Digitized by Google

Whenever the economics prove out, the industry will be most eager to get every piece of wood that can be removed from the forests in a long-range and environmentally sound manner.

Mr. WEAVER. There is, of course, benefit to our general economy to use the wood wastes even if a particular operation might not be economically sound. This is one of the problems I see to get the process started so that the links are there so that the markets exist. Right now there are so many links missing in the chain that somehow or other we have got to put the chain together so that individual businesses can do it profitably. That is what I really want to see, that is, the individual businesses doing this job. Do you see a problem there?

Mr. MUENCH. Mr. Chairman, this would be part of the work of the Office of Timber Growth and Utilization Research. That is, they would help forge those links and to do on a pilot project basis in cooperation with industry to demonstrate that those links can be forged and that the sound economic use of all the wood the forest is capable of growing is a reality.

Mr. WEAVER. Do you see a problem coming that we may make more uses for this wood waste than we have wood waste? Right now there is wood that is going to waste. We are not using it in any way. But, do you see the opposite problem?

Mr. MUENCH. That would be a desirable situation. I don't see it as a problem.

Mr. WEAVER. It would force the price up so we could utilize it?

Mr. MUENCH. Yes. It would get the price up so the landowners would be able to practice better forestry and get more utilization out of their forests. The name of the game in inflation control and in advancing the welfare of our citizens is productivity. That is not only productivity per man-hour, but it is also productivity in the resource use. Anything we can do to increase the productivity of our forest soils is to our long-range benefit. We should pursue it.

Mr. WEAVER. If we develop an energy generating industry dependent with large capital investment and dependent on the source of supply and also as you fellows continue using the scraps of waste to make studs, then we may not have enough to go around. Therefore, it will make capital investors a little cautious. That is really what I am talking about.

Mr. MCGRATH. I do not know that I could respond to that. I do not know enough about that situation.

Mr. WEAVER. We want to thank you very much for your interesting testimony.

We now welcome Mr. Richard Pardo, programs director of the American Forestry Association.

STATEMENT OF RICHARD PARDO, PROGRAMS DIRECTOR, AMERICAN FORESTRY ASSOCIATION

Mr. PARDO. Thank you very much, Mr. Chairman, for the opportunity to be here to present our statement in support of H.R. 13324.

I am Richard Pardo, programs director of the American Forestry Association. AFA is a national citizen conservation organization of some 80,000 members with a long history of concern for sound forest

Digitized by Google

conservation and efficient wood utilization. We appreciate the invitation to present our statement on H.R. 13324, the Wood Residue Utilization Act of 1978.

According to a recent report from the World Bank, in the developing countries of the world, fuelwood accounts for an astounding 90 percent of the wood consumption. But in this country, wood has only recently been rediscovered as a source of energy.

For example, the American Forest Institute reports that in 1970, fewer than 32,000 households in Oregon used wood as a primary source of heat. That figure has grown to over 75,000 today—an estimated 10 percent of all households in the State.

The New England office of the Department of Energy reports that by 1985, wood could replace as much as 50 percent of the No. 2 heating oil used in the State of Maine. Burlington, Vt., already produces 10 percent of its electrical power using a combination of wood chips and solid waste.

As you have heard in testimony today, wood-fueled electrical generating facilities are already on the drawing boards from Tennessee to Maine and elsewhere.

The forestry implications of this sudden interest in wood for energy are still unclear. Income from the sales of previously unmarketable wood fiber for energy production could be the key to improved management of thousands of small, nonindustrial forest holdings. If the removal of thinning, cull trees and dead and dying trees can be made to pay for itself, many landowners will be willing and able to carry out woodlot thinnings and improvement cuts that they could not otherwise afford.

On the other hand, a wholesale assault on private forests by a wood-hungry energy industry could be an environmental disaster.

At AFA we have coined the term "energy wood" to describe those sources of wood fiber which appear to offer a presently untapped source of supplemental wood-derived energy. Within this definition, we include such materials as logging residues, precommercial thinnings, low-grade or cull trees, insect or diseased-damaged trees unsuitable for other uses, wood from land clearing operations, wood from special fuelwood plantations and from presently unutilized mill waste.

Even our effort to increase the productive use of these forest residues must be tempered with a realization that under some circumstances, the material can serve a more useful purpose by being left on site. Here I am thinking of the need to return some residue to the soils as organic matter, the need to leave some trees for wildlife, and the value of leaving designated wilderness and natural trees untouched. But this still leaves thousands of tons of forest residues that could be converted into wood energy.

As you pointed out, Mr. Chairman, in your remarks in the June 28 Congressional Record, the development of more efficient and economical material handling systems is needed to harvest and transport forest residues. H.R. 13324 will help to focus attention on these needs and to provide an opportunity for practical testing of current and developing technologies. We therefore support the measure as an important link in an overall wood energy-forest conservation program.

Another area which needs attention, although not perhaps within scope of this bill, is the development of appropriate institutional

Digitized by Google

arrangements for integrating the production of energy wood into the total forestry picture. As a first step, a survey of current practices might be in order to determine how usable wood residue is now identified and procured.

Is there a potential for cooperatives designed to locate, gather, and sell these products? What educational efforts are needed to make landowners aware both of the opportunities and the potential drawbacks of energy wood production to long-term woodlot management?

In other words, how can we assure that the utilization of forest residues for energy does not conflict with sound forest conservation practices but instead enhances the opportunity for improved forestry?

I am sure that these issues will also be addressed by your subcommittee in due course, and we stand ready to offer whatever assistance we can in this regard.

Thank you for giving us this opportunity to testify.

Mr. WEAVER. I think that is a very valuable statement, Mr. Pardo. You have raised the fundamental issues that we must begin addressing. We need not only develop the technology in the process and utilize the wood waste, but we have to answer the questions you have asked here. How best to integrate the full utilization with sound forestry practices to the benefit of all?

One of the key ones, of course, which you allude to in your testimony is nutrient loss. We don't know that much about it.

Has the AFA done any studies that you know of on nutrient loss which can be referred to?

Mr. PARDO. None specifically that I am aware of. As I recall, one of the earlier witnesses, I think Mr. Resler, responded to that. We would normally look to research units such as the Forest Service and the land-grant universities for that kind of information. We ourselves do not engage in any basic research.

Mr. WEAVER. I understand. I thought that maybe with your knowledge that there might be some. I know of no organized or concentrated studies although a number of scientists throughout the country are doing such work.

Mr. PARDO. This is an area that is recognized as being one where a great deal more information is needed.

Mr. WEAVER. We are embarked on a whole new concept of the utilization of forest residues, energy, and forestry management. We have a lot of work to do.

I am pleased that everyone from the American Forestry Association and the NFPA and the private corporations are doing this work, and now others are starting to do this work too.

I only wish that we could divert some of the money that is going into some things like nuclear plants into this kind of work. There is an enormous amount of money going there.

I wish I had held this hearing a couple of days before because yesterday we held a hearing on the Seabrook nuclear plant. The utility presidents lined up and said that there was no alternative to nuclear energy, absolutely none. They said it had to be built or we would not be able to meet the demands.

I kept saying, "Have you studied or engineered what you could do with $2.3 billion which is what the Seabrook plant would cost?"

Digitized by Google

Of course, they had not. I talked about developing wood waste utilization and so on. If we had that kind of money to use, then we could really do a lot with regard to some of the problems and projects we have talked about here today.

So for the price of one nuclear plant we could divert that money for much better things. That nuclear plant is considerably more costly than the entire Forest Service budget for the year. That is just one.

I appreciate very much your coming today, Mr. Pardo. That is good concluding testimony.

We have here a statement sent by the Merry Co., Inc., in which their use of wood residues for heating a brick manufacturing plant is laid out. They fire their kilns with this, but they also have started to use this in the bricks themselves.

We also have a statement from the Sierra Club in support of the bill and a statement from the Western Forestry and Conservation Association, and from others. I would ask unanimous consent that these all be made part of the record.

I repeat that the hearing record will be open for 30 days to receive other testimony and this will include testimony from hearings that I intend to hold as an individual Congressman in Eugene and Medford, Oreg., in the next few weeks.

With that, I want to thank everyone and we will now conclude the hearing.

[Whereupon at 1:05 p.m., the subcommittee was adjourned.]

[The extraneous material submitted to the committee follows:]

Digitized by Google

STATEMENT OF THE
MERRY COMPANIES, INC.

The Merry Companies, Inc., is one of the country's major face brick manufacturers.

Based in Augusta, Georgia, we also maintain operations in both Columbia and Summerville, South Carolina.

When the effects of the winter of 1976-77 took its toll on many of the Southern states, our company, like other companies in our region were faced with an acute fuel shortage. As oil and gas increased in cost and decreased in supply, forcing many Southern brick manufacturers to shut down operations, we were able to elude this problem by using low cost sawdust, a waste product from saw mill operations to fire our kilns.

The use of wood as a fuel in brick manufacturing is not new. In the early days of this country the first brick manufacturerd were fired by wood, as oil, coal, and gas were as yet unavailable.

Our experimentation with sawdust as a fuel was the result of our use of the material as part of the brick's composition. By adding 25% sawdust to the brick body, we not only produced a lighter brick but as the sawdust in the brick burned we were able to lower our fuel requirements by 20%. Soon afterward, in 1977, we began to convert our kiln heating systems to total sawdust firing.

Thus nature's own solar energy plants, trees, which store the sun's energy daily were a natural remedy to the fuel shortage facing our company.

The sawdust we use for both brick manufacture and firing is available within a 60-mile radius of Augusta, Georgia. One truck per day provides the necessary 18 tons for operation. The sawdust is stored in a newly constructed silo with built-in safety devices to protect against explosion. The fuel is already sized from slivers about one-quarter inch long to fines. From the silo, the sawdust is moved to the tunnel kiln storage hopper. Enough sawdust for one hour operation is held on this hopper on the kiln. An enclosed conveyer, with a drag chain, is used to pull the sawdust from the kiln storage hopper and distribute it into six burner groups. The remaining sawdust is returned by a small bucket elevator to the storage hopper.

Each burner group is fed by a chute designed like an inverted cone. This prevents bridging and jamming that could occur with sawdust.

Digitized by Google

A small window located in the lower part of the chute allows the operator to visually inspect each group.

A small screw at the base of the chute, operating on a variable speed reducer, feeds a blower to move the sawdust through a two and one-quarter inch hose to the burner group distributor. The distributor is a rotating cap in which the feed hose enters the center top, and ten individual burner hoses surround the stationary base. As the cap rotates, the burner hose inlets are opened, one at a time, in sequence to allow sawdust to enter. This means each burner receives a squirt of sawdust every ten seconds. Kiln controls for adding the sawdust are tied directly into the regular kiln instrumentation and work authomatically. There are only minor changes needed in actual kiln operation to accommodate the addition of the sawdust.

Benefits from firing our kiln with sawdust have included:

1. Gas consumption, which had averaged between 500,000 to 700,000 cu. ft. per day has been curtailed. Previously, 20% of the b.t.u.'s were used in drying. This has now been reduced to zero. Since sawdust produces a long flame which provides a better distribution of heat, b.t.u.'s required per brick have been reduced from more than 10,000 to less than 3,000 b.t.u.'s over a period of six years.
2. Sawdust burning is complete and clean. No ash is left on the brick and smoke emmissions are nil.
3. Reduction in clay consumption. As noted earlier, 25% of the brick's composition is sawdust, which is burned in firing, producing a lighter brick.
4. Drying and firing time reduced. Firing our kiln with sawdust has cut our drying time from twenty-five hours to seventeen hours.
5. Reduction in shipping costs and an increase in plant capacity.
6. Reduced dependency on oil and gas has avoided fuel caused production delays.

In conclusion, by using sawdust to manufacture and fire our brick we have helped turn one industry's problem -- sawdust, into a source of revenue, and at the same time, complied with President Carter's mandate to conserve gas and oil as well as contributing to an environmentally sound operation.

Digitized by Google

by Ansel Adams in *This is the American Earth*

SIERRA CLUB

330 Pennsylvania Avenue, S.E.
Washington, D.C. 20003
(202) 547-1144

August 3, 1978

Honorable James Weaver
Chairman
House Agriculture Subcommittee
on Forestry
U.S. House of Representatives
Washington, D.C. 20515

RE: H.R. 13324, To Authorize a Series of Pilot Projects Testing Methods of Reducing Timber Waste in the National Forests

Dear Congressman Weaver:

The Sierra Club is pleased to offer its support for your bill, H.R. 13324, the "Wood Residue Utilization Act of 1978."

As we understand it, the purposes of the bill are to increase the utilization of wood residues resulting from timber harvesting and the manufacture of wood products; to develop alternate sources of energy; to reduce wild fires and adverse effects on air quality of burning wood residues; and to assist in meeting growing demands for wood products. The purposes of this bill would be accomplished by a series of pilot projects entered into by the Secretary with other public or private entities, and the sum of $15 million would be appropriated from national forest fund receipts not otherwise appropriated for this purpose.

Like you, the Sierra Club and many other environmental organizations have been concerned about the great amount of wood residues left on the ground after logging operations in the Northwest, or on the mill floor after processing operations. Many studies have pointed out repeatedly that there are potentially many billions of board feet or cubic feet of usable wood contained in these residues. It is only a matter of seeking out better methods of utilizing them and avoiding the waste to make them profitable to industry.

In a like manner, the use of such residues should operate to substantially increase our wood supply and reduce the pressure being brought to bear on areas of outstanding scenery, wilderness, and wildlife habitat. A more effective way to make use of these valuable residues can have many environmental benefits, by making better use of what we already have for wood products.

We certainly also agree that wood waste, properly utilized, can produce energy, and hopefully even create a new industry. We offer our wholehearted support for this bill, and will help in every way possible. Please make this letter a part of the record of the hearings conducted on this subject.

Very truly yours,

Brock Evans

Brock Evans
Director, Washington Office

Digitized by Google

WESTERN FORESTRY and CONSERVATION ASSOCIATION

(Since 1909)

forest conservation through cooperative effort in Western North America

One Forest Under Two Flags

AMERICAN BANK BUILDING
PORTLAND, OREGON 97205
PHONE: (503) 226-4868

STEELE BARNETT
FOREST COUNSEL

President
John Coughlin

Vice Presidents
Ernest H. Ostrander
Frank C. Schroeder
Grant Armstrong
Howard Millan
W. Lee Robinson
John C. Miles

Trustees
Grant Armstrong
A.H. Anderson
Robert A. Anderson
E.J. Bauer
Jerry Bell
Morris H. Bergstrom
Larry Biondo
Stewart Bordeaux
Wes Burch
John Callaghan
Richard Carlson
William G. Cochran
Ernest B. Cowden
Brian Davis
Reynold Dickhaus
Ron Flingere
Robert A. Hansen
Robert Holding
Robert G. Holgerson
John P. Hendricksen
Hazel H. Holmes
Robert J. Kirk
Milton O. Koppang
Into Lamatta
John Manson
Duncan H. McQuillan
John C. Miles
Howard Millan
Robert J. Muir
David Pyle
Leland M. Pugsley
Douglas K. Richens
W. Lee Robinson
James Rydebeck
Ernest C. Schroeder
J.H. Sheridan
Robert G. Steele
John Thompson
E.J. Williams
Ted Young

Secretary
Howard Millan

Treasurer
E.J. Williams

Asst. Secretary Treasurer
Edna Keyes

Past President
Robert DeLong

August 4, 1978

The Honorable Jim Weaver, M.C.
U. S. House of Representatives
Longworth House Office Building
Washington, D. C. 20515

Dear Congressman Weaver:

Thank you for sending me the copy of your proposed legislation H.R. 13324 establishing test and demonstration projects of wood residues utilization. I appreciate being informed about it and getting the opportunity to look it over.

Your idea is certainly a sound one and the emphasis definitely needed in the Forest Service's research programs. You are to be commended for initiating this action and we encourage your efforts.

My previous position with Boise Cascade and my present position has brought me into considerable contact with federal research programs. I have the concern that the research will be conducted too much in-house or contracted with the universities. As a result it will tend to be too theoretical and not aware enough of the economic, equipment or physical limitations of the prospective users. I hesitate to suggest an advisary committee, but they can be effective both in screening projects and providing input. I do hope though that some way can be found either in the bill or in the record to encourage the use of knowledgeable, practical user input.

I appreciate your keeping me informed.

Sincerely yours,

Steele Barnett

Steele Barnett
Forest Counsel

SB:k

Digitized by Google

National Association of Home Builders
Governmental Affairs Division

National Housing Center
15th and M Streets, N.W.
Washington, D.C. 20005
Telephone (202) 452-0470

August 4, 1978

RECEIVED

The Honorable James Weaver
Chairman, Subcommittee on
Forests
House of Representatives
Washington, D.C. 20515

Dear Congressman Weaver:

Thank you for the invitation you sent to the National Association of Home Builders asking for our participation in the hearings on August 18th on your bill reducing timber waste in the National Forests. The NAHB will have to decline your request to testify.

Although NAHB has no specific expertise in the area of silvaculture, we are extremely interested in measures that can be adopted to improve the efficiency of timber production. Timber, a major component of home construction, has a significant impact on the total cost of a home. Any measures that can be implemented to help increase effective timber production, and therefore reduce lumber cost is of utmost concern to the home building industry. We support your legislative proposal, H.R. 13324, and endorse the objectives of your bill.

We further understand that the $15,000,000 appropriated to the special fund to undertake demonstration projects, would not require additional federal expenditures. It is our understanding that this money would be from the National Forest receipts.

I wish to commend you for your efforts in this area. A major concern of ours is the ever increasing cost of home construction. In the past five years alone the price of a single family detached home increased from $32,000 to $55,800. The problem of increasing the cost of housing beyond the reach of the average American family is a serious one that must be dealt with. For every one thousand dollar increase in the price of a single family home, thousands of families are effectively priced out of the market. H.R. 13324 is a step to help alleviate that problem by reducing the cost of an important component of housing cost increases.

Thank you for your interest in our views. We look forward to supporting your legislation.

Sincerely yours,

Robert D Bannister

Robert D Bannister
Senior Staff Vice President

33-770 O - 78 - 8

Digitized by Google

ASSOCIATED OREGON LOGGERS, INC.
SPRING VILLAGE, SUITE #255
150 NORTH 6TH STREET • SPRINGFIELD, OREGON 97477
(503) 746-4311

August 15, 1978

Dr. Weldon Banton
Director, Office of Energy
Department of Agriculture
Washington, D. C.

Dear Sir:

Dr. Cutler suggested I write you direct after which he indicated the two of you would visit.

For several years I was engaged in management consultation with public utilities in the northwest. In that capacity, much of my time was devoted to alternative energy sources.

One of the most likely potentials available to the utilities is wood residue currently piled and burned in the national forests.

However, having reviewed at least a dozen proposals offered for slash utilization in energy use, every study fell woefully short in practicality when the method, tenure, and preparation of the effort within the woods were addressed.

This organization, recognizing the great potential of wood residue as a source for energy, together with growing public sentiment against the environmental results of burning, has formed a task force of veteran logging company owner operators to weigh all the factors and recommend constructive solutions.

Numerous questions are listed for resolution following the dozen proposals' weaknesses referred to above.

Among them are:

1. Is there sufficient woods residue in the region to insure long term availability?

2. In Oregon, at least the Legislature is considering severe limitations on burning of slash as they have already done with rye grass growers. Do we have a viable alternative?

3. Is the public willing to bear the cost of harvesting the woods residue? If so, what is that cost?

4. Could residue be economically chipped in the woods?

Digitized by Google

5. Will the Forest Service permit delays in the loggers contract calling for rehabilitation of roads and skid trails after logging to allow residue chippers and truckers to the source?

6. If chipping does not take place in the woods, what type of hauling equipment can be designed for removal to offsite facilities?

7. Obviously, present equipment is not designed to serve as a pick up device of varying sizes of wood products running from a 2" x 4' to huge cull logs. What type of mechanized equipment should be used?

8. In what condition does the Forest Service want forest floor left? Will silvaculture be a part of any residue recovery?

Dr. Banton, I am sure you could add many more research questions, as can we.

As I have indicated, the woods operation is key to any utilization program. Our plan will call for us to analyze the product uses as detailed in the many studies already completed. We will then find the logical consumers, work with the local Ranger Districts on small research and application programs, and then provide our findings for review in preparation of a comprehensive report to you prior to January 1, 1979.

We have invited the President to speak during our annual convention in January. We would attempt to provide him sufficient data for whatever use he would wish to make of it at that time.

You can understand that such studies as we propose require considerable time and expense. Professionals in the sciences and equipment modification will be necessary. We believe the costs will approach $75,000 to final report covering good weather period.

We sincerely hope your research budget will enable you to permit such a grant.

Respectfully,

F. F. (Monte) Montgomery
Exec. Vice Pres.

cc: Senator Hatfield
Senator Packwood
Congressman AuCoin
Congressman Duncan
Congressman Ullman
Congressman Weaver

Digitized by Google

National Wildlife Federation

1412 16TH ST., N.W., WASHINGTON, D.C. 20036 Phone: 202—797-6800

August 15, 1978

The Honorable Jim Weaver
Chairman, Subcommittee on Forests
House Agriculture Committee
Washington, D.C. 20515

Dear Mr. Chairman:

Prior commitments prevented us from having a representative testify in person at the public hearing held in Washington, D.C. on August 8 by your subcommittee on H.R.13324, the Wood Residue Utilization Act of 1978. The Federation is using this means, therefore, to make its views known on this important subject Accordingly, it is requested that this letter be made a part of the public record on H.R.13324

The National Wildlife Federation shares your concern that far too much wood residue is wasted or under-utilized, especially in view of our nation's need to thoroughly explore all reasonable energy source alternatives. Also, we understand your deep interest in this problem because it is likely more acute in the Pacific Northwest than any other region of the U.S.

The facts and statistics provided by you for the June 28, 1978 Congressional Record (p. H6180) and presented by the various federal agency witnesses at the August 8, 1978 hearing are sobering indeed. They clearly illustrate why there is a need to come to grips expeditiously, with the problem. Accordingly, NWF can and does, endorse the general intent of the bill.

However, we cannot support H.R.13324, as it is presently worded, for three reasons (1) a certain amount of residue and salvage timber, especially snags need to be retained for wildlife; (2) some residue needs to be returned to the soil for its nutrient values and (3) some prescribed burning of wood residues or other vegetation can be useful, especially in the South and Southeast, in the rapid regeneration of valuable wildlife habitat Also, the bill needs to exclude wilderness and natural areas from manual manipulation.

We are confident that you share our concerns outlined above, and that you do not envision the bill being used as a vehicle to denigrate the importance of meeting these needs. Therefore the Federation believes it would be prudent to address these matters directly in H.R.13324. Only then can we be sure that the bill never becomes the authority to directly or indirectly deplete wildlife habitat or to diminish other resource values

In closing, NWF endorses the American Forestry Association's statement on H.R.13324. Especially appropriate, in our judgment, is AFA's remark that "a wholesale assault on the private forests by a wood-hungry energy industry could be an environmental disaster." H.R.13324 must make it clear that such an assault is not intended.

Subject to the bill being revised to accommodate our concerns described above, the Federation can support H.R.13324.

Sincerely yours,

Thomas L. Kimball

THOMAS L. KIMBALL
Executive Vice President

Digitized by Google

AMERICAN PULPWOOD ASSOCIATION

August 21, 1978

Honorable James Weaver, Chairman
Subcommittee on Forests
House Committee on Agriculture
House Office Building
Washington, DC 20515

Dear Congressman Weaver:

This letter will serve as the American Pulpwood Association's comment on H.R. 13324, a bill to establish pilot projects for testing and demonstrating practical application of existing technology for utilization of wood residues from timber harvesting, forest protection and management, and the manufacture of wood products.

We support the concept that research can improve and speed the process toward closer utilization of forest and forest products manufacturing residues. We do have the following reservations about H.R. 13324 which we feel should be more fully explored:

1. While the Forest Service is admirably equipped to perform competent research in this field, we question their direct involvement in development and testing. In our experience, users and equipment suppliers are best suited for the effective development and testing of concepts resulting from research.

2. As the Forest Service stated on August 8th, we agree that research should not be limited, and in fact, may best be principally aimed at investigations of new technology.

3. Safeguards should be built into the legislation to avoid duplication of effort between the public and private sectors and to provide for potential cooperative or joint ventures with a minimum of red tape.

Digitized by Google

4. We feel that this research could be conducted within the framework of the current Forest Service research program. Just this year scattered laws pertaining to forestry extension, research, and cooperation were consolidated into three laws and it might be productive to explore the possibilities of achieving the objectives of H.R. 13324 within the current statutory and budgetary structures rather than through new legislation.

5. We question any concept which would result in public employees operating logging equipment, conducting harvesting operations, or otherwise functioning as though, even on a pilot basis, they were engaged in private enterprise, for obvious reasons.

We appreciate the chance to share our opinions with you and would welcome any further opportunity to provide assistance. Our membership is actively involved in this developing technology and we have been working cooperatively with the Forest Service in the field of residue utilization for more than ten years.

Sincerely,

K. S. Rolton

K. S. Rolton
Executive Vice President

KSR:dm

Digitized by Google

SOCIETY OF WOOD SCIENCE AND TECHNOLOGY
Post Office Box 5062 Madison, Wisconsin 53705

Reply to:
Department of Forest Products
College of Forestry
University of Minnesota
2004 Folwell Avenue
St. Paul, MN 55108

August 21, 1978

The Honorable Jim Weaver
Congress of the United States
House of Representatives
Washington, DC 20515

Dear Mr. Weaver:

As president of the Society of Wood Science and Technology (SWST) I received a copy of your letter dated August 8.

I appreciate being informed about the open hearings to be held in Medford on August 25 and in Eugene on August 29. I have contacted SWST members in the western United States and it is my hope that the Society will have representation at the hearings.

The membership of the Society consists of professionals working in the field of wood utilization. The professional pursuits include production, policy matters, research and education. Consequently the Society is quite interested in a bill that relates to the utilization of wood waste.

One of the objectives stated in our Constitution is: "Encouraging policies and procedures which assure the wise use of wood and wood-based products." It is generally recognized that in the future the forest products industries will rely much more heavily upon logging and forest residues for the production of wood-based products. Milling residues are currently heavily utilized for both products and energy.

I'm taking the liberty of enclosing a complete statement of the Purpose and Objectives of SWST.

Once again, thank you for inviting our attendance and good luck with the hearings.

Sincerely,

Robert W. Erickson

Robert W. Erickson
President, SWST

jp
cc: Executive Board
Bob Krahmer
Tom Maloney

Digitized by Google

Society of Wood Science and Technology

Purpose and Objectives

The purpose of this Society is: (1) Developing and maintaining the unique body of knowledge distinctive to wood science and technology. (2) Encouraging the communication and use of this knowledge. (3) Encouraging policies and procedures which assure the wise use of wood and wood-based products. (4) Encouraging high standards for professional performance of wood scientists and technologists and acting as the professional organization for individuals who meet these standards. (5) Fostering education programs at all levels of wood science and technology and furthering the quality of such programs.

Digitized by Google

INTERNATIONAL PAPER COMPANY

WOOD PRODUCTS & RESOURCES GROUP

WESTERN OPERATIONS
GARDINER/VAUGHN AREA

BOX 308, VENETA, OREGON 97487
PHONE (503)935-2215

September 8, 1978

The Honorable Congressman James Weaver
United States Congress Building
Washington DC 20510

Dear Congressman Weaver:

I was unable to attend the August 31st hearing at Eugene on your proposed slash utilization bill and would like for you to have my input.

I am a professional forester who oversees the management of approximately 250,000 acres of forest land that International Paper Company owns in Oregon's Central Coast Range. I have been working at forest harvesting and management operations for the last 18 years. For several years I have been aware of the potential opportunity which could come from the problem of slash resulting from forest harvesting operations.

The concept you are proposing for utilizing slash is a very progressive step to countering this country's increasingly critical energy problems. I support your bill to the extent that I feel methods and technology must be developed for utilizing the majority of logging slash as a feasible fuel source.

We should not, however, preconceive the idea that broadcast burning will and should be eliminated by removing the bulk of the slash.

Resulting from my past experience, I feel that controlled broadcast burning of a harvested area is a major tool needed to insure successful regeneration of desirable tree species. It is the best alternative we have available for removing undesirable brush species, if only for a short period of time, in order to get maximum ground area prepared for planting. Fire also generally controls the rodent populations for the period of time needed to get a seedling established. It has been my experience that fire, when used properly as a site preparation tool, greatly reduces the need of herbicide as a brush control alternative.

If economical ways of slash utilization can be developed, the amount of woods residue which would need to be burned will be greatly reduced. Thus, much less smoke will be put into the atmosphere contributing less to the discomfort of those who are bothered by it.

I support the concept of using forest slash as an energy source, but I do not want to see that be the reason for eliminating necessary slash burning as a regeneration tool.

If I can be of any assistance to you on this matter, I would be glad to avail myself for that purpose. Would you please send me a copy of the latest draft of your slash utilization bill as I have not had the oppotunity to see exactly what has been included in it.

Yours very truly,

J. W. Will

J. W. Will, Woodlands Manager
GARDINER/VAUGHN AREA

Digitized by Google

STATEMENTS SUBMITTED AT TOWN MEETING, MEDFORD, OREG., AUG. 25, 1978

STATEMENT OF RONNIE ENOCH, GRANTS PASS, OREG.

Plan for the removal of slash by man and mulcher.

(1) Plan of approach: (a) The slash would be cut in double lengths and moved up the steep sides on portable conveyer belts; (b) all of the smaller wood, would then be ran through a mulcher machine. This would be a good investment and also a good idea for future tree planting.

(2) Plan of operation: (a) The operation would be subsidized by the Government and would get a percentage of the firewood sales; (b) Government slash sell contracts.

STATEMENT OF JIM IRBY, EAGLE POINT, OREG.

Hon. Jim Weaver and fellow citizens: This Waste Utilization Program is one of the most practical and sensible programs ever to come up in Congress in my lifetime. I particularly want to stress the fact that we have an Oregon invented and developed process called Woodex for use of waste slash, currently operating not only in Brownsville, Oregon, but in a number of plants in states back east operating 24 hours daily with many more plants under construction. The process so changes the molecular structure that it produces only very slightly less BTUs per lb. than coal at comparable cost and in consideration of benefits in most cases, less cost. The fantastic practical advantages of this is that it is so pollution free that no emission control systems are needed for this perpetually renewable source, while burned fossil fuel is lost forever, and Woodex is non-toxic, as are coal fumes.

Kingsley Air Force Base at Klamath Falls saves $300,000 on pollution control, plus $10,000 annually on maintenance alone. There is very little ash and even that has agricultural value. West Washington State Hospital has been using it for 2 years obviating the need for pollution control and at substantial savings annually. Crown Zellerbach at Fairhaven pulp mill found out its 350,000 lb. per hour boiler would meet emission standards using it. Since the new "Jackson Bill" will eliminate the disparity between rates paid between P.U.D. and private customers according to Sen. Hatfield's statement in Aug. 15 Oregonian, obviously the "preference clause" will be totally worthless. Its emasculated form was left in only as a sop.

While the above Solar Bio Mass Woodex Corp. already has arrangements for all necessary financing, yet in keeping with the lip service of the Federal and State government, I respect that you use your influence to obtain even cheaper financing for alternate renewable sources of electricity, in this case specified slash waste and a plant for PUD near Medford.

Although Woodex can be made from any fibrous material, this would keep employment in southern Oregon with plants perhaps in each county, since the plants are relatively cheap. Just this morning, Aug. 25, Bio Solar Research informed me that they can give us 10,000 lb. steam at $15.33 to $19.16, variation depending on available material and other variables FOB Brownsville, or $22.67 to $28.33 in Medford. Difference due to transportation. But if we wanted they would build plant here, provide employment here and provide at first above prices, or in other terms 100,000 BTUs at 13½¢. In other words a 50,000 BTU home heating unit would cost $1.62 for 24 hours at full capacity. For six months of the year it would be $291.60. but since most homes would only use about ⅛ that amount, the monthly heating bill for those homes over the 12 month period would be $6.10 monthly.

Since by the nefarious lobbying of private power they seemingly are eliminating any benefit of the Bonneville Act to public bodies, but which I sincerely request you fight, as per the intention of your promise to Jackson County Democratic Convention, to retain benefits of old fashioned preference clause, this is the most practical and logical and entirely feasible way to go instead of subsidizing eastern fat cats and at the same time wasting a cheaper and renewable Oregon resource and Oregon employment.

We need absolutely no coal from Montana or Canadian line, nor transmission lines from there. Oregon has ample renewable fuel which can be by air pressure used in pellet form to fire any boiler using gas or oil or coal. It can also be gasified to use as natural gas. Proof of the ruinous cost of the present Jackson bill is in

Digitized by Google

Fred Miller's, Dir. of State Energy Dept. statement (Oregon Statesman, July 16) quote, "If cost of hydro electric power is boosted to cost of electricity generated by new thermal power plants, hydro electric would be 10 times more expensive." that is 1,000%. In the same article, he also stated: According to his Dept. of Energy forcasts we wouldn't need new thermal facilities until the 1990's. No more all electric homes should be allowed in Oregon.

STATEMENT OF LYNN NEWBRY, MEDFORD CORPORATION, MEDFORD, OREG.

Mr. Weaver: My name is Lynn Newbry, P.O. Box 550, Medford, Oreg. I am director of public affairs for the Medford Corp. and am presenting this statement today on behalf of our company.

There is no question but what the wood residues resulting from timber harvesting, which we call slash, is a problem in many ways and constitutes a sizable source of energy. H.R. 13324 recognizes these facts and is directed toward a solution of the problems in a constructive manner.

Before discussing the bill further, it should be stipulated that the disposal of slash, either through burning on site, or removal from the site, is absolutely essential to sound forest management. This bill should in no way be viewed as providing an instant solution or instant alternative to current slash burning practices, but rather as the bill directs, is a vehicle for the institution of pilot studies.

The idea of utilizing wood residues as an energy source is not new, as a matter of fact, it is being done every day. The Oregon Legislature conducted hearings on the subject less than a year ago. This is the first time, to my knowledge, that hearings have been held at the congressional level, and we thank you, Mr. Weaver, for bringing the matter to the attention of your colleagues in the Congress.

Although the difficulties and problems associated with finding an economic use for slash are tremendous, they are not altogether insurmountable and we believe H.R. 13324 is a timely piece of legislation. A large part of the problem is economics. Wood residue is a good source of energy, but it is not a very concentrated energy form. As a result, transportation and handling is costly. The product of this bill may find a solution to handling, but transportation costs will limit the distances that residues can be hauled under current economic value. Simply stated, the end use of the wood for fuel must be close to the supply.

This constraint brings us face to face with air quality problems. With the exception of the Umpqua, all the inland valleys from Portland to Ashland are classified as "nonattainment areas" under the Clean Air Act. The further conversion of wood waste into energy by burning is virtually impossible. Two years ago Medford Corp. began investigating the possibility of building a new steamplant with cogeneration capabilities. This plan would have released 10 megawatts of electric energy for use by other customers in the P. P. & L. service area. This plan was abandoned completely with the passage of the 1977 amendments to the Clean Air Act, simply because there is no way such a plant can be built without impacting this air shed.

Alternative sites outside the Medford-Ashland AQMA were considered, but two additional problems foreclosed that option. First, the nondegradation provisions of the Clean Air Act require environmental impact studies which are so costly that the project became infeasible. Not only the cost of these studies, but the risk of challenge of the results of such studies is extremely great. Our management group would not risk a half a million dollars on an EIS with no assurance that the project could go ahead. The second problem of locating a site some distance from the point of end use is the cost of transmission lines. Private companies do not have the same advantage of utilities in building lines and the utilities are not equipped nor do they have the inclination to "wheel" this power for us. An extremely helpful addition to H.R. 13324 would be an amendment to the Clean Air Act giving special consideration to the use of wood wastes for fuel similar to what was given in the case of coal conversion.

Digressing for just a moment, what perplexes us is that notwithstanding the prohibition against degrading the air quality in a national park and the concern by the EPA over slash burning, the National Park Service has deliberately permitted a wild fire to burn all summer long at Crater Lake National Park. It appalls us that a Federal agency can totally ignore the Clean Air Act.

Digitized by Google

Before leaving the subject of burning wood as an energy form, some discussion of houehold heating is appropriate. Sitting at home watching an open fire in the fireplace on a cold evening is as American as apple pie. Homeowners plagued with the high cost and scarcity of fossil fuel are naturally turning back to the use of wood and a resurrection of the wood stove industry is occurring. All of which we believe is fine, appropriate, and attests to American ingenuity. Like many other things we thought to be wholesome and healthy, however, the household burning of wood is creating an impossible situation with regard to the achievement of ambient air quality within this AQMA. The DEQ estimated that residential heating with wood constituted a 938 ton source of suspended particulate. This represents only about 6 percent of the total which appears relatively low. The problem is that it comes in only about 5 months of the year so during that particular period, the impact is of much greater significance. This particulate load also comes during the months of greatest air stagnation. The very time when the violations of ambient air quality standards for particulate occur here.

Before anyone jumps to the conclusion that we are advocating the elimination of wood as a home heating fuel, which we are not, let me make my point clear. Household heating with wood does impact air quality to a greater degree than other fuels and as its use grows, which it will, we will not be able to achieve air quality standards in this area.

What we are really saying in all this discussion is that you cannot simply move the burning of slash from the woods into town either for industrial burning or household use without doing more damage to air quality than already exists.

It should be pointed out here that burning in the woods is controlled so as to be done during low stagnation periods and is well above the elevations of inversion so that it is widely dispersed.

One other matter relevant to the success of H.R. 13324 is the value that currently exists for energy forms. In order to take advantage of the energy value of forest residues, it must be competitive with other energy sources. In the Northwest, we are blessed with low cost hydropower. This is an advantage we all jealously guard. It may very well be, however, that this blessing will foreclose the generation of electrical energy from wood fuel.

Other energy forms such as methane gas or methanol have not been competitive with natural gas or petroleum products at current values. The move to deregulate gas and petroleum pricing may change all this and ultimately move us into a more competitive position for wood.

At the beginning of this statement, we congratulated you and said this bill was a timely piece of legislation. We say this because it opens a forum for the discussion of some very important issues that are interrelated. The success of this bill in finding alternate uses for slash and other wood residues will depend upon a full understanding of the need to make some trade-offs, particularly in Congress' view of energy values and in the Clean Air Act.

We make one final recommendation. We have no trouble with the Forest Service being the disbursing agency for the appropriated funds. We do have serious doubts about the Forest Service's ability to carry out the pilot projects as a research organization. The bill should be amended to make it clear that the funds would be used to retain private contractors to carry out the pilot programs and research.

Thank you, Jim, for this opportunity to share our views on H.R. 13324. If you have questions, I would be happy to respond.

STATEMENT OF JOHN L. SMITH, INDUSTRIAL FORESTRY ASSOCIATION, PORTLAND, OREG.

I am John L. Smith, Medford District Forester for the Industrial Forestry Association. Our Association represents a number of firms in the fourth Congressional District. Additionally, I am affiliated with the Southern Oregon Timber Industries Association Timber Committee. This group represents the majority of timber purchasers and processors in the Medford-Grants Pass Area.

From the start of the timber industry in Southern Oregon, logging residues have been a problem. The first forest survey of Douglas County in the early thirtys showed a total gross volume of 120 billion board feet of timber. Of this, 50 billion was judged cull material, leaving only 70 billion feet of good wood. We

Digitized by Google

were 200 years too late to properly utilize the timber stand. We're still logging in old-growth stands, wrestling with the problem of excessive cull material.

The timber industry in Southwestern Oregon is very concerned about disposal of logging residue. We are impacted from several different angles relative to disposal of this material.

First, on government timber sales we are required to remove logs which are very marginal from a utilization and cost standpoint. On some forests utility logs must be removed along with merchantable logs even though a market exists for only a small percentage of this material. There are no chip utilizing facilities close by so the Medford-Grants Pass area must transport chips some distance. This results in a lower price for the log at the chipper. With current government timber sales requirements in force the market is saturated, possible supersaturated. The result is rock bottom prices for utility logs when we can sell them. On January 1 the Regional Forester in California is going to lower utilization standards for saw logs and this may affect the supply picture in the Southwestern Oregon area by putting more high priced marginal logs on the market. It should be obvious that the utility log market is not the way to get this material processed.

The second way we are impacted is through slash handling requirements on government contracts. We have seen an unprecedented program for physically handling logging residues in this area. This involves YUM yarding (yarding unutilized materials) gross yarding, PUM (piling of unutilized material), machine piling and hand piling. We are required to handle this material with tractors, high leads, skylines and even $2000/hour helicopters. It has gotten as extreme as requiring material ¼" by 1' to be handled using wheelbarrows and rakes. Other constraints are forcing us to remove the material offsite and handle it a second time to place it in huge stockpiles or series of piles along roads. The result is tremendous accumulation of material at great cost to the operator and the public. The public pays for this in terms of housing and wood products costs which have steadily increased in recent years. A side problem not commonly examined is the cost of handling this material in terms of petroleum products. This material is processed using diesel and gasoline, at a very inefficient rate. Costs are allowed in Forest Service appraisals, but are woefully inadequate. The operator routinely has to absorb the cost in the merchantable log handling cost.

We frequently hear government employees commenting that YUM and PUM yarding are incentives to remove the material. They feel the operator is subsidized to get the material on to the landing and the material should have a zero cost at that point. Therefore, the operator wants to haul the material to market and make a profit. This is very shortsighted. The type of trucks needed to handle this material are in short supply. Haul costs, road maintenance costs and PUC fees quickly eliminate any profit, especially when one realistically considers the costs which were not covered by appraisal allowances. Thus, that material on the landing is already costly and hauling it to a processing plant for $40 per M log prices isn't going to make money.

The third impact comes from required deposits for slash disposal. We are required to pay the government to burn these accumulations of residues. Repeatedly we find deposits in excess of $15/MBF on timber sale contracts. Repeatedly we find areas where the accumulations are not being burnt. Why you may ask? We ask the same question. But the purchaser is still required to pay the deposit.

The fourth impact is in the form of threats. We constantly are told by government employees that if they can't treat the slash they won't put up the timber sales. In essence, if we complain too loudly or fight excessive slash handling costs and requirements we won't have to worry about them. The sales program will decline. This is followed with threats about the relationship between slash treatment and regeneration. We are told that if the slash is not adequately treated and regeneration cannot be achieved within a specified time period, the allowable harvest calculations will have to be adjusted downward to compensate. In many situations we contend the slash requirements have been detrimental to the regeneration program by being too thorough.

The final impact comes from tightening air quality requirements. We are finding slash burning increasingly constrained by regulation, to the point of threatening it as a viable management tool. Yet we continue to accumulate tremendous piles of this material awaiting burning.

I have presented these points to make you aware of the position in which the industry finds itself. Basically, we are between the proverbial rock and the hard spot. You have observed the symptoms of the problem, tremendous accumulations of unmarketable residues, whose disposal is constrained by tightening environmental regulations.

Digitized by Google

As I have pointed out, there is a great deal of money tied up in this material. Furthermore, its disposal or lack thereof could materially affect the health of our industry in the near future. We appreciate your concern and efforts. We are concerned however that the efforts may not solve the problems.

Ideally, the solution should be market controlled. It should be a function of supply and demand. We briefly experienced a healthy residue market in the early 70's. The industry responded and residues were taken care of. We would like to see a pulling effort stimulated by demand rather than a pushing effort stimulated by supply. Currently the demand has not surfaced, either for pulp or energy generation.

Technology to convert residues to energy currently exists. If a market existed, industry would voluntarily seek new technology and improve existing technology without government subsidies. There are some real problems facing the developer of facilities to process and utilize logging residues. Government regulation is one. To install a cogeneration facility in Medford today would be impossible because of governmental regulations. Handling and transporting materials using petroleum fuels, including costs to get the material to the landing, are not cost competitive against even privately generated power. Utility companies can supply power at less cost.

The investment in generating facilities is not attractive to utility or timber companies at this time. Recent history on projects of this nature indicate gross cost overruns resulting from delays in obtaining permits, changing government requirements during construction and public and government harassment following completion. There are some mills with generating facilities, but they use mill residues which currently are in ample supply to meet demands.

The industry would prefer to see efforts made to clear the way or set the stage, if you will, for increased utilization of logging residues. We need relief on "trade off" programs and realistic slash specifications. Pilot programs may play a role in defining these, but they will not get the program rolling on a production scale. We wholeheartedly support utilization of forest residues at the highest level possible. Economics rather than subsidies will set that level.

We suggest that before proceeding further with the bill you appoint a committee of timber industry people, energy specialists and environment regulatory people to analyze the problems and see what can be done to solve them.

Digitized by Google

ROBERT W. STRAUB
GOVERNOR

Department of Environmental Quality
SOUTHWEST REGION
1937 W. HARVARD BLVD., ROSEBURG, OREGON 97470 PHONE (503) 672-8204

August 25, 1978

Medford DEQ Testimony on HR 13832

The Department of Environmental Quality supports efforts to reduce necessary agricultural and silvicultural open burning. We believe Mr. Weaver's bill is a straightforward approach to this goal.

Portions of Jackson County exceed state and federal air quality tandards for suspended particulate, photochemical smog and/or carbon monoxide. Slash burning is a significant source of particulates in Southwestern Oregon at or near the time of peak particulate levels in the Medford Valley Oregon's smoke management plan coordinated by the Department of Forestry, has been effective in reducing the direct impact of slash burning emissions The very d fficult problem of residual smoke remains, however Drainage winds tend to draw residual smoke into lower elevations at night. We believe the impact of residual smoke is more closely related than the direct impact of smoke plumes to the volume of slash burned.

Mr. Weaver's bill attempts to reduce emissions at the source. This is the surest way to reduce air pollution problems.

There are valuable uses for s ash material using present technology. Problems with implementat on have been economic in nature. The pilot projects and funding of Mr. Weaver's bill should provide an important avenue for finding practical alternatives for utilizing forest slash.

Slash utilization alternatives for Jackson County should carefully evaluate the effects on air quality in the Medford Valley. The u timate utilization of slash materials may occur in the more heavi y populated areas of the county. Any implementation proposal should insure continued improvement of air quality in all areas of the county.

In summary, DEQ supports Mr. Weaver's bill. This bill should help develop environmentally and economically sound alternatives to open burning of forest slash. We would expect these alternatives to result in long-range improvements in local air quality.

Merlyn Hough
Environmental Specialist
Medford Branch Office

Digitized by Google

TESTIMONY OF THE OREGON ENVIRONMENTAL COUNCIL REGARDING
H.R. 13324 - Utilization of Wood Residue from Timber
Harvesting, Forest Protection and Management, and the
Manufacture of Wood Products. Medford, Oregon, August 25, 1978

My name is Eleanor Bradley, and I speak today for the Oregon Environmental Council. The Council is a coalition of approximately eighty environmental, health, planning, recreation and labor organizations, as well as 3,000 individual Oregonians.

We are immensely pleased with the introduction of the Wood Residue Utilization Act of 1978. It is directed toward attaining goals to which we give a very high priority.

Passage of this bill would give a major boost to efforts to improve air quality. In the Emission Inventory for Jackson County dated June 1978, DEQ credits forest burning with 45% of the fine particulates emitted in the County, 35% of the total suspended particulates, 24% of the carbon monoxide, and 19% of the total organics.

The effect of these emissions on the most populated portion of the County---the 228 square mile Air Quality Maintenance Area that stretches from Shady Cove south to include Central Point and Medford and then southeast to take in Ashland---is mitigated by conscientious implementation of the Smoke Management Plan. This Plan is designed to keep visible smoke out of populated areas, but it isn't fool-proof. Weather conditions and wind directions can change quickly, bringing smoke into the valley rather than carrying it away. Every once in a while one of those prescribed burns becomes the-big-one-that-got-away. Then we're in real trouble with a planned burn that becomes a forest fire. It doesn't happen often, but it happens.

DEQ's data indicates that 97% of the particulates generated by slash burning are fine particulates. Slash and other forest burning is the largest source of fine particulates in the county, exceeding the forest products industrial contribution by over 400 tons a year.

Fine particles are too small to be screened out of the lung by the body's natural defense mechanisms. For this reason, they are a serious threat to human health. Particles of 0.1 to 1.0 micrometers in diameter are close in size to the wave length of visible light, and are therefore extremely effective in absorbing and scattering light. Finally, these tiny fine particulates can be transported very long distances by prevailing winds.

All of these considerations cast some doubt as to the ability of the most perfect smoke management plan to protect human health against the damage that fine particulates do.

A further problem is that the Plan is focused on visible smoke. It does not deal with organics or with oxides of nitrogen, which are precursors of smog. Their effect is area-wide, and their impact on populated areas is just as deadly as automobile exhaust emissions when they are transformed by sunlight and heat into smog.

The obvious solution to these problems is to reduce the volume of wood residues burned, and this bill can make a significant contribution to that end.

Digitized by Google

Air pollution isn't the only major problem this bill can help solve. In an era when we face a potentially crippling energy shortage, the wood residues now simply gotten rid of by burning can and must be put to productive use.

Last fall, an acquaintance of mine had some visitors from Austria during a period of heavy slash burning and terrible air. Their background was in forestry, as was their host's, and talk inevitably got around to the burning of slash. The guests' reaction was a horrified "Why, we heat all of Austria on what you burn up on the forest floor."

I am not suggesting that the use of wood residues ought to be confined to keeping people and places warm. Heat does a lot of things including generate electric power, and it seems possible that some bright researcher can figure out how to do it with wood residues in a way that's a lot cleaner than with coal.

We keep hearing about pellets and wafers and mulch....some of these uses needing more research and experimentation, some ready to go into production. The important thing is that good minds are coming up with solutions to the problem, and what they need is just the kind of boost that this bill offers.

. . . . . .

We have one minor problem with the text of the bill. On page 2, in lines 4, 5 and 6, is the intent to develop new technology and test and demonstrate the practical application of existing technology? Or to develop, test and demonstrate.....existing technology?

Aside from that problem of semantics, we have only praise for the bill, and wish it a speedy and safe trip through the Congress. Thank you for the opportunity to place our comments in the record.

Eleanor L. Bradley, for the
Oregon Environmental Council

33-770 O - 78 - 9

Digitized by Google

FOREST EDUCATION AND ENERGY INSTITUTE
300 East Main St.
Ashland, Oregon

Prior to 1973, the idea that our country was facing a major energy crisis was generally not acknowledged or accepted. The oil embargo, blackouts and brownouts, and the spiralling cost of energy have all combined to make us aware of our problem and desirous of solutions. However, the effort to expand alternative energy technologies has thus far been unorganized and fragmented.

In the following text, we propose to make the search for solutions more efficient by coordinating activities and programs in such a way as to encourage small governmental units, institutions, businesses and even families to develop and take advantage of a mix of alternative energy sources. We will explore all of the renewable energy sources; that is, all the alternatives to the use of fossil fuel with the exception of nuclear energy.

By using a synergistic planning approach to the subject of alternative energy, technologies which are presently in competition with one another for research and development dollars will be combined and coordinated in one integrated system which can be transferred to any regional locale in the United States. Individual successes in low technology solutions such as small windmills, solar collectors, waste-product converters and the like are not generally seen to be cost-effective. However, if these technologies are integrated into one regional energy package and the resultant energy savings are then multiplied by the thousands of local regions in the United States, the potential nationwide impact could be extremely significant.

Oregon has long been a leader in conservation and the use of alternative energy sources. The energy consciousness of Oregonians has been demonstrated repeatedly through efforts such as the nationally known bottle bill, slash utilization, concern over wilderness areas and the beautification of state parks and forest lands. Jackson County, through which runs the Rogue River, lies in the southwest corner of Oregon, bounded by the Siskiyou and Cascade mountain ranges. Citizens in this area must import most of the energy they use from outside the valley at considerable expense. Present efforts to utilize new energy sources include biomass conversion of forest and industrial waste, small solar and wind projects and investigation of geothermal sites.

Digitized by Google

Forest Education and Energy Institute is headquartered in Ashland, the second largest city in Jackson County. The Institute operates a hands-on Woodsworking Program that trains disadvantaged men and women in the logging trades. An important part of the program encompasses biomass conversion of forest waste and education in conservation practices and techniques.

F.E.E.I. currently works with the academic community, local governmental and non-profit agencies and the wood products industry; thus we are in a unique position to continue to interface between these groups and to act as both a clearinghouse for ideas and a locus for communication. F.E.E.I.'s involvement in so many sectors of the community enable it to tap a wide variety of local talent.

Forest Education and Energy Institute proposes to coordinate a comprehensive integrated program of alternative energy sources. We will review all existing energy ideas in order to determine which combination of alternative energy sources and techniques work best in differing environmental backgrounds.

We will also monitor and coordinate both the intended and unintended consequences of alternate energy projects.

To better disburse the information and expertise gained through the program we propose to establish an "energy store" for the energy conscious consumer.

The program will also develop a baseline study of the Rogue River Valley which will allow us to evaluate and measure the impact of new energy sources on the region.

Finally, F.E.E.I. will develop and implement an energy education program for the public designed to make the Rogue Valley more energy efficient and aware of available energy-saving devices.

Forest residues, when left in the woods, present a fire hazard, an invitation to the onset of bug infestation or disease, a hindrance to reforestation and an aesthetic detraction from an area. Current forest practices usually call for piling of this residue or burning in the woods.

Collectable wood residues for the region were determined to be unused mill and bark fiber and waste fiber from logging operations.

Digitized by Google

THE AMOUNT OF FOREST RESIDUE BIOMASS MATERIAL AVAILABLE IN OREGON

(Thousands of Tons Available per year)

Biomass Source	West Oregon	Total Oregon	Total Energy(2) KW HR
Logging Residue(1)	4.400	5,200	10,400,000
Forest Industries Unused Mill Residue	1,100	1,400	2,800,000
Total	5,500	7,500	13,200,000

(1) considered as "slash" now left in the woods.

(2) calculated at average heating value of 7,000 BTU/lb and 50 percent overall process efficiency which approximates 2,000 KW-HR per ton of biomass.

The Bureau of Land Management (BLM) Sustained Yield Report of 1978, a combined figure for Jackson and Klamath County, states there is 35,000 tons of slash available.

An Oregon-Washington survey on Mill Residues indicates nearly a complete utilization of everything but bark. These wood residues supply fiber for pulp and paper mills, particle board firms, and raw material for plant fuel. Bark is either fired as fuel or disposed of some other way.

CURRENT UTILIZATION OF MILLWOOD AND MILL BARK USED ANNUALLY IN OREGON FOR FUEL

Quantity in Dry Tons	Maximum Potential in BTU 1/	Realizable Potential in BTU 2/
4.79×10^6	81.4×10^{12}	53.7×10^{12}

1/ at 8500 BTU/lb

2/ at 66% conversion efficiency

The basic problem associated with the utilization of forest residues is economic delivery of the product to the processing point as the residues are dispersed throughout the forested areas. Generally, collection of a nonuniform material such as wood residue is accomplished most economically when the material is broken down into a uniform size for long distance transportation. Equipment such as whole tree chippers or portable hammer hogs are currently available to accomplish this task. Once the residue is reduced in size it is blown into a semi-trailer for transport to a

Digitized by Google

processing point. Studies have shown that although log size pieces might be best transported on a standard log truck, transport of the smaller residue material without this reduction process is very costly and inefficient.

Although quantities of municipal waste are not large relative to other biomass sources, there is an economic incentive for utilizing them in energy production. They are readily available, are already collected and present municipalities with a costly disposal problem.

AMOUNT OF MUNICIPAL WASTE MATERIAL AVAILABLE IN OREGON

Thousands of tons available per year

Biomass Source	Western Oregon	Total Oregon	Total Energy KW-HR[1/]
Municipal refuses	900	1,000	2,000,000

[1/] Calculated at average heating value of 7,000 BTU/lb and 50 percent overall process efficiency which approximates 2,000 KW-HR per ton of biomass.

Crop residues show sufficient quantities to justify their continued investigation, but not all the residue listed is available for energy. In fact, most is currently used as animal feed, as a soil conditioner or for some other agricultural use. The energy prospects for crop residues do not appear to justify their further analysis at this time. The conversion process for wood and municipal waste would be equally applicable to crop wastes.

A portion of the proposed program we wish to develop involving biomass conversion, would be "Forest Slash Pelletizing". Our plan would include development of slash removal methods, finding uses for this slash, and developing chipping and pelletizing methods. We will investigate market availability and set up a central distribution point. Groups and agencies who could potentially benefit from forest slash utilization will be contacted and encouraged in their use of this alternative energy source.

Digitized by Google

Statement of Bruce Shaw, Medford, Oreg.

My name is Bruce Shaw, resident of the City of Medford, Jackson County, Oregon. My interests in this proposed Bill stem from two areas, one; the Air Quality impacts of slash burning, and two; the energy and resource potential currently being overlooked. As Jackson County's Air Quality and Energy Coordinator, I hope to provide this hearing with some information which maybe used to further the chances of this Bill's passage.

Before starting in I want to thank the Congressman for a Bill which should be noted for its brevity, three pages must be a record of some sort. However, by copying on both sides you would have saved two pages of paper. Any proposed conservation Bill should keep that in mind - back to back copying.

Before going into a listing of benefits realized by enactment of this Bill I would like to voice some reservations I have.

First, as everyone knows, wildlife habitat is on a very delicate balance in our forests. The natural succession of life in the forests provides a multitude of living regions for a wide variety of wildlife. This includes areas which are "overgrown" with thick brush. Deer are the prime example of large game animals that require brushy areas for forage and bedding. I might add that the natural succession of the forests is to pass through a heavy brush stage at an early phase. This is followed with some broad leaf, low trees, then some pines, and finally through various stages of fir tree development. In drawing up the guidlines for forest use, I would ask that, large areas of habitat be protected.

Another area of concern I have is the effect of slash removal on our water sheds. The removal of, again thick brush, can significantly effect surface runoff rates, erosion rates, groundwater recharge rates, and siltation of streams, and rivers, ultimatly effecting fish spawning and availability of irrigation water.

Now I've listed but two of what may become a rather lengthy list of major and minor concerns. These two are by no means minor concerns. However, through proper management of the program,

Digitized by Google

negative impacts may be mitigated. Wood residue utilization is certainly a better end use than spraying of herbicides, contributing to wildfire potential, removing forage and habitat for wildlife, creating soil erosion and poisoning of our streams, etc. All the while waiting for a good burn day, so that planting may proceed.

JACKSON COUNTY AIR QUALITY:

As everyone is aware of the Medford-Ashland area of Jackson County has a notorious Air Quality problem. Under the State of Oregon's Smoke Management Plan, slash smoke contribution to our basins air quality is minimized. However, excursions into our valley are documented. These occurances are not only from burns located nearby, some comes from as far away as several hundred miles away. The Smoke Plan though has a double edge to it, that is on the one hand slash burns must be controlled so as to protect designated areas (Urban Centers) while at the same time clearing must be accomplished to allow planting. In 1977, 448,000 tons of slash was able to be burnt out of a total of 610,000 tons prepared and ready to burn in Jackson County alone. An interesting aside is that 86% of those burns allowed were piled, meaning that the materials burnt had been handled at least once.

According to the DEQ Emmission Inventory, dated June 13, 1978, slash burning within Jackson County alone accounted for 2016 t/yr TSP; 52 t/yr, SO_2; 486 t/yr NO_x; 15,547 t/yr CO; and 2914 t/yr organics. If one applies the 1.4% figure of problem burns to those figures as a guideline for slash impacts directly upon this air shed they are:

TSP - 28.2 tons
SO_2 - .73 tons
NO_x - 6.8 tons
VOC - 40.8 tons
CO -217.6 tons

This area's Air Shed experiences problems with three pollutants, total suspended particulates, Carbon Monoxide, and Photo Chemical Oxidents. Slash burning contributes somewhat to all three problems, however, there is not much likelyhood that slash burning contributes any significant amount to the CO problem, though the possibility

Digitized by Google

exists that it may create localized problems in the valleys near the burn sites. The other two pollutants of concern to this area are the particulate emissions and organic emissions - while the frequency of smoke intrusion is low, when it does occur the valley carries the full brunt of those emissions - Each of these pollutants can contribute greatly to an already poor air quality condition, in some instances enough to take us over the threshold of Air Quality Standards. Minimizing, even eliminating these emissions, can assist us in our efforts to insure air quality and levels of pollutants which are safe to breathe.

A large portion of any environmental problems center upon energy use and process losses. An interesting quote we've all heard is "One man's garbage may be another man's gold" or oil as the case may be. In the past few years, first working on environmental problems in a chemical plant and now in studying this areas problems, I'm always been impressed by the tremendous amounts of waste of materials and energy. In fact a long list of usable even valuable products result from implementation of control techniques. A good example of this locally is the fiberboard production from what had in the past burnt in a wigwam burner as waste. Many industries are now looking at their waste streams as a potentially valuable resource.

We must apply this some ethic to the one major resource the Pacific Northwest, and particularly Jackson County has. That is our forests.

I'll not try to address the whole spectrum of products available from wood residue utilization, other than to mention that this Bill could develop new industries in waxes, fertilizers, insulation, medicines, even chemicals and plastics.

However, I will address the tremendous energy potential of wood residue. Using some simple factors developed by USDA, I have calculated the following energy potentials of slash.

Digitized by Google

	TONNAGE AVAILABLE	
	Proposed	Actually burnt
State	7,946,416	3,554,534
Jackson County	610,149	448,012

Assume all Douglas Fir waste (with relatively low energy content) it takes 26.4 tons of wood to supply all of the electrical needs of a 22,000 KWH per year home, the average all electric home.

	ALL ELECTRIC HOMES	
	Proposed	Actual
State	301,000	134,641
Jackson County	23,112	16,920

If on the other hand the slash were only used for space heating, hot water needs, and cooking, then the following numbers of homes needs could be met - Assuming 12.5 tons per year usage.

	Proposed	Actual
State	635,713	284,362
Jackson County	48,812	35,841

Of course direct conversion of wood to heat by individual users brings with it inherant Air Quality dangers. This consideration alone may, in our specific case, make it more feasible to utilize wood residue at a central location, then distribute the electrical or gaseous energy to individuals. However, it is possible for private users to make better use of wood energy through multiple chamber burning thus reducing both the total amount of wood being utilized and reducing the emissions of what wood is burnt. Some work may also be done in improving wood fermentation or distillation techniques to provide liquid fuel. In any case, the energy resource is available and the technology is on the shelf to provide a clean, renewable energy resource.

One final note, Jackson County will soon be beginning the process of studying resource recovery, as a ultimate solution for solid waste handling It may well be that wood residue will provide a supplement to this process, and hopefully resulting in an energy independant Jackson County.

Digitized by Google

Statement of Larry Simmonds, Medford, Oreg.

SFC has designed a program to use the total slash, eliminate the PUM and YUM problems, and provide a new source of wood energy. This program -- FIBRE ENERGY -- will remove all unmerchantable material from the forest, convert it economically into a new form of virtually non-polluting fuel, and reduce the American consumer's dependence on fossil fuels.

SFC proposes a three-to-five year period of study and practical application (in conjunction with the U.S. Forest Service) to explore methods of increasing reforestation, to minimize the risk of forest fire, and to demonstrate the simplicity and benefits of the FIBRE ENERGY program.

The following comparison of the present system and FIBRE ENERGY details the methods, effectiveness, and benefits of the two systems.

COLLECTION AND REMOVAL - PRESENT SYSTEM

PILING AND YARDING: Presently, it is the responsibility of the purchaser (logging contractor) to yard, pile, or hand-pile unmerchantable material as directed by the USFS. The contract logger must handle the slash material several times before it is located and prepared for burning. This process is costly in both time and money -- some loggers estimate the process reduces their productivity by 30 - 50%.

COST: The purchaser's responsibility for yarding and piling unmerchantable material can add from $150 to $1,500 per acre to the cost of timber removal. For example, on one recent sale of 70 acres in Southwest Oregon, the cost (over and above the BD Fund charge) was $700 per acre to yard and pile the sale. Obviously, this expense reduces the logger's profit and results in higher costs to the consumer of wood products.

EFFECTIVENESS: Because the machinery used to yard and pile unmerchantable material cannot operate in either very wet or very dry weather, slash material can be gathered during a maximum of eight months a year. The prime burning season in most areas is even shorter -- usually only about 40 days per year. Several problems result:

Digitized by Google

1. Piled material must be covered and protected until it can be burned.
2. Piling retards the forest planting program and causes waste of nursery stock which cannot be planted at the optimum time.
3. Piled material, if not burned quickly, if a fire hazard.
4. Piled material becomes a breeding ground for pests which can infect live trees.

BURNING: The USFS is responsible for burning slash. Although several methods are used and strict ground control is observed, the very short burning season creates many forest management problems and safety hazards.

COST: Under controlled conditions, the cost of burning ranges from $30 to $100 per acre. Adverse conditions increase these costs further.

EFFECTIVENESS: Under perfect conditions, light controlled fire is desirable. However, these conditions do not exist often during the average burning season. If a fire burns out of control, toxics are released into the atmosphere to create environmentally undesirable results. Also, uncontrolled burning creates the obvious disadvantage of forest fire with its destruction of timber and animal life.

To complicate the problem further, recent federal regulations prohibit burning near Wilderness Areas. These rules have eliminated burning as a slash removal method on many timber sales. In addition, burning -- even under the most desirable circumstances -- wastes untold amounts of potentially valuable energy.

COLLECTION AND REMOVAL - SFC

TOTAL REMOVAL: SFC has the technology to remove slash material totally from the logged area and transport it to a processing site. From level ground to 40% adverse, typical low-ground-pressure machines will be used to collect the slash. Special attachments, designed by SFC, will increase the efficiency of the removal process. In tower logging areas, a special brush fork incorporated into a simple carriage system (designed by SFC) will be used to collect the slash.

It is anticipated that, as the study period progresses, more sophisticated methods and equipment will be used to simplify further the removal process and reduce damage to the terrain.

Digitized by Google

EFFECTIVENESS: SFC, by totally removing the slash material in one step, avoids the loss in productivity and frees the logging contractor to concentrate on removing merchantable timber. By eliminating the piling process, SFC also reduces unnecessary soil disturbance caused by the repeated use of heavy machinery in the contract area. The problem of insect infestation also will be reduced greatly if piles of slash do not remain in the forest for long periods.

In areas where adverse conditions make piling economically unfeasible, YUM methods must be used under the present system. Through total removal, SFC will reduce the fuel load on the forest floor, which in turn will reduce the fire hazard and enable the USFS to plant new trees more efficiently.

PROCESSING - SFC

FIBRE ENERGY: The USFS estimates that 800 million tons of logging residue will be burned during fiscal 1978-79. SFC believes that slash material which is being wasted presently can be converted into a source of industrial and domestic fuel. SFC proposes to create a renewable fuel source which is efficient, relatively non-polluting, and economical for use in common furnaces.

MARKETS: SFC presently is negotiating with the Eugene Water and Electric Board and the University of Oregon to provide wood waste for use as fuel. The domestic log market on the West Coast also is under consideration. Just these few markets would require a supply of several million tons of wood waste per year. Additional markets can, of course, be developed as the study period progresses.

Digitized by Google

Statement of Donald H. Smith, Forest Supervisor, Rogue River National Forest, Region 6, Forest Service, U.S. Department of Agriculture

I welcome the opportunity to speak in support of a program to establish pilot projects to improve wood utilization along the lines as outlined in H.R. 13324 as did Associate Chief, Rex A. Resler on August 8, 1978 (before the Subcommittee on Forest, Committee on Agriculture, House of Representatives), and Deputy Regional Forester Frank Kopecky earlier today.

You have received information on the National and Regional situation, so I will limit my statement to the specific subjects which you requested from the Rogue River National Forest.

Before I provide our Forest's information, I believe it would be helpful to define several terms which I will use:

Slash - All vegetative material such as; cull logs, pushed out stumps, windthrown, chunks, broken tops, limbs, decayed wood, and damaged brush, reproduction, saplings or poles resulting from any natural occurance or human activity.

Fuel Loading - The total amount of forest residues in a specific area by size class measured in tons/acre.

Fuel Rating - The fuel type identification describing forest fire rate of spread and resistance to control.

These terms and supporting data are displayed in the Photo Series for Quantifying Forest Residues, Coastal Douglas-fir, published by the Pacific Northwest Forest and Range Experiment Station, USDA, Forest Service. (Technical Report PNW-51, 1976). We use this publication as a working field guide and I am giving you a copy for your reference. We have used this guide to develop the amounts of slash residue produced annually on the Rogue River National Forest.

This National Forest generates 8,000 acres of slash averaging about 50 tons/acre for an annual total of 400,000 tons of residue. This is lower than other Forests west of the Cascades because we primarily use the

Digitized by Google

shelterwood silvicultural method to regenerate our timber stands. (Using this method, we enter the stand two or more times to remove the existing timber stand. Merchantable trees remaining after the first cutting help protect the newly established stand against climatic extremes. Final overstory removal is scheduled when new crop trees are established.)

The Field Guide descriptions on pages 42, 48 and 100 photographically illustrate and quantify our typical residues. Of the total fuel loading, 9 to 12 tons per acre are in the 3 inch or less fuel size class. Presently, This material is too small to economically remove from the woods. Although small in size it must still receive some treatment to lower the fire hazard (fuel rating) and prepare the site for planting. It is Forest Service policy to reduce the fuel rating to at least moderate rate of spread and moderate resistance to control, to permit reasonable probability of protecting these resources from wildfire.

We currently dispose of the remaining logging slash by burning. The methods used are broadcast burning (5%), underburning (25%) and machine and handpiling followed by burning (70%).

We encounter the typical problems associated with residue reduction on this forest. Foremost is meeting the air quality/smoke management restrictions during burning operations. We do extend our burning season to the limit and burn day or night, depending on weather conditions. This requires considerable manpower/equipment coordination to meet 24 hour scheduling.

The ever changing economics of the wood chip market play a big role in the amount of large material which remains in the woods. It must pay its way to the market or it is left. The smaller material which could be utilized for fiber or fuel end products is difficult to handle and would probably be chipped in the woods to minimize handling and transportation costs.

There are other factors in slash treatment. The fire hazard and risks

Digitized by Google

are increased with each entry into the woods. To keep this to a minimum, the wood residue should be removed at the time of logging. We must leave some residue for wildlife cover, soil protection and nutrient recycle. And, finally, there will definitely be a continuing need to use fire as a resource tool to meet hazard reduction (fuel rating) reforestation needs, and for the natural role fire plays in protection and enhancement of various ecosystems.

There are a number of important factors related to increased residue removal from the woods:

- The fuel loadings would be significantly reduced, particularly in the larger size classes.
- Necessary burning would be more economical.
- The cost of doing the remaining hazard reduction and site preparation would be less and in most cases require fewer personnel.
- The impact on air quality would be reduced.

To encourage greater utilization the Forest Service in this Region in July revised the timber sale utilization standards. The minimum size pieces to be removed on new timber sales has been reduced from 80 to 30 board feet. This should help reduce the amount of wood left on the sale area.

On the Rogue River National Forest, we are participating in programs to utilize slash residue materials. Depending on market economics, many firms utilize cull and chip logs. We have an active salvage sale program of 8 million board feet annually representing 102 sales. On my forest this involves trees killed by windthrow, insects and disease. We also average 3,300 free-use firewood permits (5.6 million bd. ft.) and 34 commercial firewood sales (100,000 bd. ft.) each year which help to reduce the quantity of slash requiring treatment.

In summary, we believe there are a number of opportunities to initiate the program outlined in HR 13324. Increased removal of heretofore unmerchantable or unused residues will enhance the management of all timberlands, federal, State and private. At the same time, forest land managers can deliver more energy and fiber to our nation. I must repeat, however, that prescribed fire is a very necessary, efficient and effective resource management tool which we must continue to utilize in our intensive forest management effort.

Digitized by Google

STATEMENTS SUBMITTED AT TOWN MEETING, EUGENE, OREG., AUG. 29, 1978

STATEMENT OF HON. JAMES WEAVER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OREGON

The bill we will be discussing today would authorize the Forest Service to establish a five year program of pilot projects for the utilization of the slash and wood waste left in our national forests after harvest.

We have millions of tons of slash on the forest floor that will either be burned and cause air pollution, or will be left to decay. At the same time we face a serious shortage of energy supplies in the Northwest and across the nation.

The problem lies in getting the slash out of the forest to where it can be used instead of wasted. That is the problem this bill is designed to solve.

Slash is potentially one of the cheapest sources of new energy available to us today. But the Forest Service does not currently have the authority to transport or sell slash on the open market. This bill would give the Forest Service that authority.

A successful program of slash utilization, begun by the Forest Service in cooperation with private enterprise, could provide the Northwest and other timber regions with a welcome source of renewable energy and also increase employment opportunities in our mills and forests.

One example of the type of project I have in mind was suggested at the hearing we held in Medford Friday by Ashland mill owner Jerry McGrew and Bob Frank of Southern Oregon State College. They proposed burning slash at McGrew Brothers sawmill to provide energy for the mill and also for Southern Oregon State College.

This is the type of project we need to see become reality here in the Northwest as quickly as possible. We can no longer afford to waste the tremendous energy potential offered by millions of tons of slash in our National Forests.

Digitized by Google

IN REPLY REFER TO:

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

OREGON STATE OFFICE
P.O. Box 2965 (729 N.E. Oregon Street)
Portland, Oregon 97208

State Director's Testimony at Hearings on H. R. 13324
(Prepared in response to Congressman Jim Weaver's letter of August 10, 1978 to State Director Storms)

1. Amount of slash produced-number of acres burned-average cost, etc.

BLM manages 2.4 million acres of commercial forest lands in western Oregon, of which 1.9 million acres are available for timber production under principles of multiple use and sustained yield. The allowable cut of 1.172 billion board feet of timber is sold annually.

Harvesting of this volume of timber, during an average year under our current allowable cut plan, will create volumes of woody debris on about 20,000 acres, most of which presently support old growth coniferous stands more than 200 years old prior to logging. Pacific Northwest Forest and Range Experiment Station data indicate that, on the average, about 2,000 cubic feet (or about 28 tons) of residues per acre remain on Bureau-administered lands after harvesting. Thus, about 40 million cubic feet (or 560,000 tons) of residues are created annually by harvesting operations on Bureau-administered lands in western Oregon. Experiment Station information also indicates that about 80 per cent of these residues can yield sound wood chips.

Areas of Slash Burned Annually

Logging residues are burned for two principal reasons:

1. To reduce fire hazard.

2. To prepare cutover sites for reforestation. In this connection, massive accumulations of woody debris can preclude successful, timely regeneration of forest sites, with resulting increases in length of rotation and decreases in allowable cuts.

Slash burning is not always necessary. Such intermediate stand treatments as commercial thinnings, sanitation-salvage and shelterwood cuttings may create such light fuel loadings per acre that little or no hazard reduction or site preparation is needed. Final harvest treatments (primarily clearcutting) produce the largest volumes of residue. Even with clearcutting, favorable market conditions may promote nearly complete utilization of raw material so that, after completion of yarding, the cutover site is essentially ready for planting.

33-770 O - 78 - 10

Digitized by Google

For example, for calendar years 1973 to 1977, inclusive, clearcutting produced significant volumes of slash on about 16,100 acres annually. During this five-year period, the Bureau planned to burn an average of only 14,250 acres yearly, or about 1,850 acres less than the total area of significant slash. However, burning was successful on only 7,900 of the 14,250 acres leaving about 6,350 acres unburned or incompletely burned. The average area of unburned slash annually carried over for treatment during the following year was about 3,550 acres.

Our Medford District with relatively smal acreages in clearcuts, differs from the western Oregon norm. During the aforementioned five-year period, the Medford District planned no slash burning.

Delayed completion of slash disposal causes losses in net annual growth and value We would estimate the loss of carrying the 3,500 acres during the five-year period to be 700 thousand board feet per year at a value of $1,500,000.

Obviously, slash burning is an expense for any landowner who manages stands of timber. However, when massive logging residues must be reduced, burning is usually less costly than such alternative measures as yarding un-merchantable material or onsite chipping or burying of slash.

Costs for piling and burning of slash created by partial cuts in our Medford District average $2.00 to $3.00 per M bd. ft. or about $30 to $90 per acre, depending on volumes of timber harvested. In the other western Oregon districts, average burning costs range as follows:

	Average Costs Per Acre 1/	
	Low	High
Area ("broadcast") burning	$40	$150
Piling or windrowing and burning	$75	$250

1/ Including planning, preparation, supervision, buring, mopup, patrol.

Burning costs are influenced by several variables, including fuel loading, fuel moisture content, weather conditions, topography and various risk factors, and therefore fluctuate widely

2. Special problems in smoke management caused by slash disposal.

During the three-year period of 1975-1977, an estimated average of 38 000 acres of slash was burned annually on all classes of forest land ownership west of the Cascade summit in Oregon and Washington. This burning consumed an estimated 5.1 million tons of fuel in each of the three years. Successfully burned BLM-administered lands represented only about five per cent of the total area burned each year.

Digitized by Google

Although the Bureau's contribution to the total volume of atmospheric smoke and particulate matter may be a relatively minor one, we are nevertheless very much concerned about smoke management In Oregon, major air quality problems exist in the urban areas of Portland Salem, Eugene-Springfield and Medford-Ashland. Because of the location of BLM-administered lands, we are particularly concerned about the Eugene-Springfield and Medford-Ashland areas.

To illustrate, I will describe the situation in our Eugene District last year. Usually, 40 to 50 days are available for fall burning of logging slash in that district. However last year about 20 days of the burning period were lost because of wet weather. Burning during another 20 days was precluded to protect air quality in the Eugene-Springfield area. Thus, only five to ten days remained in which to accomplish all planned burning. Of 4,180 acres planned, only 2,900 acres were burned.

3. The effects of BLM timber sale contract provisions on utilization of logging residues.

The Bureau's contract provisions are of two general kinds:

- Standard provisions, which consist of the various numbered sections of the printed contract form. These apply to every timber sale contract.

- Special provisions, which are appended to the printed contract form under Section 41 of the standard provisions The special provisions are selected from an array of approved stipulations which covers nearly all timber harvesting contingencies By judicious selection of special provisions, the timber sale planner can tailor the contract to achieve the desired forest management objectives.

With the possible exception of Section 3 none of the standard provisions discourages utilization of logging residues Section 3 establishes the time during which the purchaser may cut and remove timber until such time has expired, the purchaser has full control of the dispos tion of timber sold under contract, including residues. Thus until expiration of the purchaser's right to cut and remove timber, BLM cannot permit a third party to remove logging residues from the contract area without the purchaser's consent.

Other aspects of the standard provisions and contract exhibits promote the purchaser's close utilization of all merchantable material sold. BLM timber sales are made on a tree cruise, lump sum basis. The purchaser of BLM timber is obligated to pay the total purchase price, whether the

Digitized by Google

volume of timber removed is more or less than the volume estimated. Thus, the purchaser usually finds it to his advantage to remove all merchantable portions of the timber sold. This incentive is particularly strong when a good market exists for low quality material As a result, it has been our experience that a lump sum sale results in a closer utilization (and a "cleaner" forest floor) than does a scale sale.

The special contract provisions are frequently used to require yarding of un-merchantable material ("gross yarding" in BLM terminology) in order to clear streams of obstacles to fish passage to reduce overloading of unstable soils on steep slopes, to prepare cutover sites for reforestation, etc. Frequently such operations indirectly subsidize closer utilization of logging debris Once "cull" material is decked on or near a road, the purchaser may find it profitable to haul it to a utilization center or, after contract termination, another individual may desire to buy the material.

4. The problems encountered by Melvin Johnson of Myrtle Point, Oregon in removing logging debris from BLM-administered lands within our Coos Bay District's Burnt Mountain Resource Area.

understand that recently a Bureau forester found Mr. Johnson, a resident of Fairview Route searching through some unburned slash piles in Section 9 T 28 S., R. 11 W., W.M. The piles had been created by gross yarding on a recent logging operation which removed timber sold under contract to Coos Head Timber Company of Coos Bay. Mr. Johnson was searching for marginal logs, firewood and remaining cedar.

When questioned by the BLM employee, Mr. Johnson stated that he had received permission from Coos Head Timber Company to remove this material However, the purchaser's contractual right to cut and remove timber had expired, and Coos Head Timber Company had no authority to grant such permission. Therefore the BLM employee told Mr. Johnson to discontinue his activity on the contract area.

Mr Johnson then asked if he could buy the material from BLM. The Bureau employee gave him a negative reply because of Coos Head Timber Company's continuing liabilities, including potential liability for fire escapement, under the terms of the timber sale contract, which had not been terminated.

At this point, it is important to make a clear distinction between "contract expiration" and "contract termination." A BLM timber sale contract is said to have "expired" when the specified time for cutting

Digitized by Google

and removal has passed. After such expiration, the contract remains in effect until the purchaser has satisfied all of the obligations specified by the contract provisions, including such requirements as road repair and maintenance, slash disposal, erosion control, etc. After the purchaser has satisfied these requirements, the contract is "terminated." Termination releases the purchaser from any further obligation or responsibility under the contract.

Mr. Johnson had decked some firewood on a landing and asked the Bureau employee if he could remove it. In order to accomodate Mr. Johnson, our forester contacted Coos Head Timber Company for their consent to third-party operation on the contract area, for removal of the decked firewood only. The company consented, and BLM sold the firewood to Mr. Johnson, who removed it and discontinued his search for salvageable logging residue.

I also understand that the BLM employee explained the nature of the Bureau's timber sale contracts, including the rights and obligations of both parties. He also told Mr. Johnson that his best opportunity for salvage of logging residues on BLM contract areas would be by contact with timber sale purchasers before rights to cut and remove timber have expired.

We make some sales of logging residues after contracts have been terminated. Such sales are rather costly administratively, but we do what we can to promote such utilization.

Digitized by Google

Statement of John E. Alcock, Supervisor
Willamette National Forest, Forest Service
U. S. Department of Agriculture, before a
Public Meeting on HR. 13324-13832 on
August 29, 1978 in Eugene, Oregon

Mr. Weaver:

I appreciate the opportunity to make a statement at this meeting on H.R. 13324-13832, and to give my enthusiastic support of the statement given to you on August 8 by Associate Chief Rexford A. Resler.

You may remember that Associate Chief Resler made a specific comment about the Department's increasing concern about slash utilization, "particularly in the Pacific Northwest where the harvest of old growth timber creates large volumes of unutilized material." In my comments today I would like to provide an insight into the day-to-day job of slash management in a Pacific Northwest forest that still has a predominant cover of old-growth timber.

In the 1890's John Minto, writing in the Oregon Horticultural Bulletin, commented on the extraordinary values of the"red fir" that blanketed the foothills and slopes of the Oregon Cascades. Writing from his office in Salem, he could see extensive stands of Douglas-fir—his "red fir"—surrounding Salem. He estimated these stands would be more than enough to satisfy that city's needs for the future, so that the valuable mountainside timber probably never would be needed.

Digitized by Google

Less than 40 years later Mr. Minto's predictions were overridden by factors he could not see. In many respects, our view of forest slash is similar. For many years we did not consider it to be valuable—it seemed a worthless residue. Slowly we have come to see its value, and now—with change so much a part of our thinking—we are better able to predict that it will be needed. There are many problems to solve before slash utilization will become a complete reality, but HR 13324-13832 will help to bridge the gap, in my opinion. I believe we may be ready to take another major step forward in utilization. The obvious need is there for energy sources from renewable resources and to reduce air pollution. We estimate that 60 per cent of the standing timber on the Willamette National Forest is old-growth, meaning it is more than 250 years old. Older timber naturally has more defect in it, running an average of 36 per cent of volume, and in some of our harvest units logging residue may run up to 300 tons per acre. We estimate that the Willamette annually produces from 700,000 to 900,000 tons of slash annually.

To give some perspective to this volume, the Eugene Water & Electric Board during 1977 used 260,000 tons of hog fuel to generate 87.5 million kilowatt hours of electricity, plus steam heat for downtown Eugene. Thus, if slash from the Willamette National Forest could be delivered in a form suitable for burning like hog fuel, at a competitive price, it potentially could provide enough energy for three similar electric generating plants.

This is an exciting prospect.

Digitized by Google

The Willamette National Forest, as you know, is the nation's largest timber producer. During 1977 our sale of 757 million board feet of timber produced revenue of $150,135,000, including road credits of $10,380,000. To produce this timber, we harvested 6,820 acres by clearcut, and 7,725 acres by other harvest methods. There are several methods to dispose of the slash from these operations, and in an average year, we will burn about 14,000 acres in all kinds of burning activities.

At the present time, we have experienced some difficulty in accomplishing our slash burning within the limitations of the Oregon Smoke Management Plan. It has definitely meant additional costs for us. In Fiscal Year 1977, due to smoke management constraints and weather, we had a 30 per cent fall down and this year it will be approximately 20 per cent. As public concern about air quality increases, additional restrictions on slash burning could affect our annual harvest of timber because it in turn affects our reforestation activities, causing a long term affect on allowable harvest.

Because we share a concern about the waste of this resource, particularly in the face of predicted energy shortages in this country, the Willamette is working to have more and more of this slash used.

We issue free use permits to the public, allowing them to take up to 10 cords for personal use in the home. Last year we issued 8,254 free use permits, continuing an annual increase in the number issued.

Digitized by Google

We issued commercial firewood permits for small businesses to remove materials for sale. So far this year we have issued 58 of these permits. Last year, 1977, we issued 35.

The Forest has increased the small sales program to encourage small operators to remove wood that might otherwise go to waste. So far this fiscal year we have had 43 of these sales for 25.3 million board feet worth $4.5 million. We also have other classes of salvage sales, all of which are increasing.

We have issued 167 permits so far in 1978 (compared to 145 permits in 1977) for miscellaneous gatherings of forest products, such as cedar, shakebolts, posts, and rails. We have had sales of hog fuel type materials with Westfir Plywood Co. in which they have purchased 1.7 million board feet of cull material for fuel to run their mill.

In addition to these special programs, there have been several trends in utilization which means that material once left behind is now used. For example, since we began using a slash disposal method called Piling of Unutilized Material (PUM), we have seen the increased use of cull peeler logs go from 50-60 per cent to almost 100 per cent utilization. At present we have about 30 per cent use of utility grade material from timber harvest activities.

I should emphasize, however, that so far the Willamette National Forest's special programs and the trends have involved the "best of the worst" and there today is not any forseeable program for utilizing 100 per cent of logging salvage.

Digitized by Google

There are a number of exciting programs on the horizon or in practice now that hopefully will mean better utilization and less residue. I refer to increased use of hog fuel for electric generation, additonal plants such as the Woodex process, increased demand for firewood, greater demand for wood fibre in the manufacture of hydrocarbons, alcohols, glues, and plastics.

I want to emphasize at this point that even with a market for much of the residue we are currently burning, we don't feel it would eliminate the need for broadcast burning to prepare sites for planting. It would drastically reduce the tonnage burned, thus reducing the amount of pollutants. But in many areas the small-size residues would still be of sufficient density that would prohibit reforestation unless it was broadcast burned.

I will close my statement on a feeling of optimism. There are many possibilities to use wood material that is now going to waste. H.R. 13324-13832 is timely in light of air quality and energy concerns. It will permit us to develop, test, or conduct pilot projects of currently known technology, allowing us to depart from rules and procedures that limit our ability to engage in these. It will stimulate solutions to the utilization of slash, and provide demonstration of the economic use of it, including gathering, transporting, and processing. I assure you that the Willamette National Forest and the sophisticated Forest products and energy industries in our area are anxious to work cooperatively with all interested parties to further this end.

Thank you.

Digitized by Google

STATEMENT OF
JERRY F. FRANKLIN, CHIEF PLANT ECOLOGIST,
PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION,
FOREST SERVICE, U.S. DEPARTMENT OF AGRICULTURE
AT MEETINGS ON THE WOOD RESIDUE UTILIZATION
ACT OF 1978 (H.R. 13324), AUGUST 25 and 29, 1978

Congressman Weaver:

I appreciate having been invited to discuss some ecological considerations in connection with programs for slash or residue utilization. I offered a similar statement several years ago in connection with hearings on the National Forest Management Act. Further evidence of interest in the subject is a symposium on Impact of Intensive Harvesting on Forest Nutrient Cycling to be held in August, 1979 at Syracuse University, New York. My remarks to follow apply specifically to Pacific Northwest forest conditions.

Ecological Functions of Forest Residues

There is a tendency to take a negative view of forest residues as waste, fire hazard, or an impediment to regeneration. Research is demonstrating, however, that in appropriate forms and amounts, residues play important ecological roles. Such new appreciations of residues, especially woody debris, are just emerging from ecosystem-level research programs, such as the cooperative Forest Service-Oregon State University-National Science Foundation scientific effort at western Oregon's H. J. Andrews Experimental Forest.

Digitized by Google

Residues are, of course, energy-rich organic materials that contain substantial amounts of nutrients. Thus, one of the major natural ecological roles of residues is as energy and nutrient sources. Under natural conditions, organic materials of this type are the major paths by which nutrients flow and are conserved; i.e., leaves, twigs, limbs, and boles fall to the ground where they are gradually mineralized by decomposer organisms and nutrients again become available for use by plants.

Large amounts of litter and woody debris (as it is known under natural conditions) or slash (as it is known on logged lands) are a major nutrient sink in the short run (since nutrients are only slowly made available). In the long run, however, this material becomes a major source of energy and nutrients for the ecosystem. It is important to recognize that the organic materials typically contain only a small percent of the nutrients present on a site; the soil is usually a far larger storehouse. Nevertheless, some materials, such as leaves and fine twigs, are especially important as more readily available and highly concentrated nutrient resources.

Woody debris in various forms is important in providing habitat for wildlife. A variety of creatures including birds, mammals, and amphibians use such material (particularly logs) for protective cover, feeding and lookout sites, food sources and storage, and nests and dens. Providing for the needs of these species is, of course,

Digitized by Google

a land management objective. But there are also very practical reasons for providing small mammal habitat. Conifers are strongly dependent upon a mutual association (called mycorrhizae) between their roots and specific fungi for good survival and growth. Small mammals, such as voles, are the primary means for dispersing these fungi; they consume the fruiting bodies and carry the spores to new areas where they can germinate and inoculate the tree seedlings (Maser, Trappe, and Nussbaum 1978). Larger logs are especially important to such mammals in providing protected pathways into the dangerously open environment of a cutover. Heavy accumulations of slash, however, can restrict movement of large animals.

Mineral soil is a key requisite for regenerating the new forest, but rotten wood is sometimes significant as a "soil" or substrate for several reasons, including its high moisture-holding ability. The work of A. E. Harvey and his co-workers in Montana provides several examples of the critical role of decayed wood as a site for active root functioning, particularly during periods of limited moisture availability (Harvey, Jurgensen, and Larsen 1978); organic materials are also important as sites of active ectomycorrhizal root tips in comparison with mineral soil.

Recently it has been discovered that substantial nitrogen fixation takes place in larger woody debris, i.e., by microbes living in snags and down logs, and other decomposing woody materials (Franklin, et al. 1978).

Digitized by Google

Such fixation can have a favorable long-term impact on fertility of the site. While elemental nitrogen is, of course, abundant the supply of usable nitrogen is often limiting to plant growth; most fertilization programs attempt to improve this supply. Natural pathways for addition of usable nitrogen include fixation by microbes associated with legumes, such as clover, and some other plants, such as alder and ceanothus.

Residues, including the residual forest floor, provide an important erosion-resistant cover for the logged-over site. Debris dams can also play important roles in maintaining the productivity and stability of stream ecosystems and reducing erosion rates (Swanson, Lienkaemper, and Sedell 1976). This is particularly true of natural (prelogging) debris dams but does not apply to large accumulations of unstabilized slash in stream bottoms.

Residues are the major source of soil organic matter. Any farmer is well aware of the importance of organic materials as soil amendments. Organic matter is of comparable importance in forest soils although we often fail to think of it in those terms. Perhaps this is because on farms, major sources of soil organic matter are roots and stubble that is plowed under each year, while sources of forest organic matter are largely on soil surfaces and remain there for long periods of time.

Digitized by Google

In any case, as Dr. Walter B. Bollen, a retired distinguished professor at Oregon State University, has stated (Cramer 1974):

> Organic matter is the cream of the soil. It is a storehouse of available and potential nutrients, improves soil structure, increases water holding capacity, buffers against changes in pH, and absorbs cations...against leaching even though they remain available to microbes and roots.

Providing for appropriate amounts and types of organic materials is, therefore, an important concern in residue management. In their careful analysis of the effects of intensive utilization and fire on microbial ecology, Harvey, Jurgensen, and Larsen (1976) make clear its importance:

> The processes and organisms involved in residues decomposition are essential to soil development through carbon and mineral cycling and conservation...timber harvesting in conjunction with prescribed burning or intensive fiber utilization should be adjusted to provide an adequate organic matter base for these processes. Failure to do so in the past has resulted in decreased site productivity.

In conclusion, the collection of organic material referred to as forest residues plays several important ecological roles. These materials are energy and nutrient sources of ecosystems, wildlife habitat, rooting media, sites for nitrogen fixation, erosional cover, and sources of soil organic matter. The necessary forms (leaves, logs, branches, forest floor, etc.) and amounts (weight, number of logs, etc.) of these materials will vary with site conditions and management objectives. Desirable

Digitized by Google

levels are only vaguely known, however, and their quantification is a high-priority research need. We can, however, set some first-approximation guidelines for removal of woody material for Pacific Northwest forests.

Guidelines on Removal of Materials

Some general statements are possible about the materials that can be removed without impairing ecosystem functions. One fortunate circumstance is that merchantable tree boles contain relatively small proportions of the nutrient capital. Leaves, fine twigs, and fine roots have relatively high concentrations of nutrients; any management scheme which removes them should be critically examined since few sites can tolerate sustained removals of this rich and easily decomposed nutrient source without fertilizer subsidies. Stump removal on slopes in the Pacific Northwest appears to be an undesirable practice for several reasons including that of accelerated erosion.

Some larger woody debris (logs, chunks, and branches) should be left to fulfill functions discussed earlier. Desirable levels are not known. Fortunately, however, heavily rotted logs, which are least suitable for commercial utilization, are generally of greatest value ecologically. Ecological function and economics are compatible in this case.

Digitized by Google

Use of Fire Under Intensive Utilization

More complete utilization of forest residues will not eliminate the need for prescribed burning. It should reduce the acreage on which fire is necessary, reduce fire intensities, allow greater latitude in burning conditions, and, in several ways, result in a net reduction in atmospheric pollution from prescribed burning.

Fire will still be necessary for several purposes. Even under intensive residue utilization large amounts of fine materials will remain which, for reasons of hazard reduction and site preparation, must be eliminated. Fire may be needed occasionally to mobilize nutrients otherwise tied up in organic materials or to provide suitable growing conditions for nitrogen fixers such as alder and ceanothus. Fire will sometimes be the only practical way of reducing shrub competition, especially with restrictions on herbicides. It may be useful also to use fire for control of pathogens.

In unharvested old growth, even greater volumes of woody residues may be generated naturally as a result of tree mortality. In such cases, the occurrence and magnitude of wildfire is greatly increased. Again here, prescribed underburning to lessen fire hazard may be necessary.

We can, therefore, conclude that fire must be used as a resource management tool regardless of the levels of residue utilization.

33-770 O - 78 - 11

Digitized by Google

Conclusion

I have tried to indicate some of the ecological roles served by forest residues. They are not simply waste, a mechanical impediment, or a fire hazard. Appropriate types and amounts need to be retained but we do not have good quantitative information on what these amounts should be.

In no way should my comments be interpreted as a rationale for leaving large quantities of forest residues untreated. Very large volumes of woody materials are generated by logging of virgin, west-coast forests and their reduction by burning or removal is often imperative. Ecological functions need, however, to be considered along with fire protection, utilization, and young stand establishment and management in making decisions on residue treatment. Our forestry research programs in the Pacific Northwest include studies aimed at a better understanding of the ecological role of forest residues and how best to manage woody residues.

Digitized by Google

Literature Cited

Cramer, Owen P.

1974. Environmental effects of forest residues management in the Pacific Northwest. USDA Forest Serv. Gen. Tech. Rep. PNW-24, various pagination.

Franklin, Jerry F., Kermit Cromack, Jr., William Denison, Arthur McKee, Chris Maser, James Sedell, and Fred Swanson

1978. Ecological characteristics of old-growth forest ecosystems in the Douglas-fir region. Unpublished report on file at Forestry Sciences Laboratory, Corvallis, Oreg. 72 p.

Harvey, A. E., M. F. Jurgensen, and M. J. Larsen

1976. Intensive fiber utilization and prescribed fire: effects on the microbial ecology of forests. USDA Forest Serv. Gen. Tech. Rep INT-28, 46 p.

Harvey, A. E., M. F. Jurgensen, and M. J. Larsen

1978. Seasonal distribution of ectomycorrhizae in a mature Douglas-fir/larch forest soil in western Montana. Forest Sci. 24(2): In press.

Digitized by Google

Maser, Chris, James M. Trappe, and Ronald A. Nussbaum
1978. Fungal-small mammal interrelationships with emphasis on Oregon coniferous forests. Ecology 59: In press.

Swanson, Frederick J., George W. Lienkaemper, and James Sedell
1976. History, physical effects and management implications of large organic debris in western Oregon streams. USDA Forest Serv. Gen. Tech. Rep. PNW-56, 15 p.

Digitized by Google

Statement by Richard E. Worthington,
Regional Forester, Pacific Northwest
Region, Forest Service, USDA,
Portland, Oregon

Mr. Chairman:

I welcome this opportunity to speak in support of a program to establish pilot projects to increase wood utilization as outlined in H.R. 13324 and talk about the opportunities and challenges it will bring to our Region. My remarks can perhaps give you a Regional perspective to the testimony on H.R. 13324 given by Associate Chief Rex Resler before the Subcommittee on Forests in Washington, DC, on August 8. We are pleased to note the Subcommittee's responsiveness to Mr. Resler's recommended amendments and believe their inclusion in your new Bill--H.R. 13832--significantly improves the legislative proposal.

There are opportunities in many areas of the National Forests and State and private lands in the Pacific Northwest to gain better utilization of wood residues. In the long run, this closer utilization will increase timber supplies from the Northwest and could produce a multitude of products.

Increasing utilization of slash and other residues will decrease the chances for the spread of wildfire as well as reduce the occurrence of forest insects and diseases. The reduction of slash and residues will also increase the opportunities for natural regeneration of trees, and will lessen the need to dispose of wood residues through broadcast burning, thus reducing some of the challenges of smoke management we have in the Northwest.

Digitized by Google

Outside of existing timber sale areas, there are also other opportunities to locate and use salvable wood materials. For example, scattered tree kill caused by insects and disease provides an opportunity for utilization. Also, in many second growth forests there is a lot of standing and down material from the original tree stands that could be utilized.

Overall, slash utilization pilot projects will not only improve the timber stands, but in the long run can improve the rural economy for markets that do not now exist.

Closer timber utilization will involve several things: (1) new techniques will have to be developed based on existing technology, and (2) this technology will have to be assimilated by the logging contractors as well as those companies that manufacture wood products, and (3) where pilot projects occur we may have to modify our existing timber sale and harvesting procedures in order to accomplish the objectives of this timely legislation. Here in the Northwest we also envision that State Foresters and industry would be involved, along with some universities, in setting up pilot projects.

Existing Forest Service timber sale contracts attempt to minimize the volume of slash which must be disposed of later by (1) requiring removal of all utilizable portions of trees designated for cutting to a diameter of six inches or less, (2) permitting removal of smaller or defective wood materials from designated trees without charge, except for payment for road maintenance or under a separate pricing arrangement in the contract, and (3) requiring piling of unmerchantable pieces larger than

Digitized by Google

a specified size for later removal by sale, if possible, or if not, the pile will be released for firewood cutting or burning.

Sale areas close to markets for wood chips are generally cleaned up fairly well. The only slash remaining is small, such as limbs and tops, deciduous brush and decomposed logs which cannot be sold and are generally made available for free firewood cutting permits to the public.

If the market for residue material can be improved through pilot projects, I believe we would see a marked improvement in local utilization and a subsequent reduction in our slash disposal problems. There may be a need to treat or burn the residual and remaining pieces of slash to assure regeneration of a stand, but the reduced volume of slash will lessen smoke management problems.

I think we should concern ourselves with the larger pieces of wood material (limbs and branches) found in slash rather than concentrate upon complete utilization of the total biomass (stems, twigs, and humus). We have the equipment and technology to remove and utilize wood materials now, but in most cases the industry does not have an adequate market to acquire and develop it into products. We would like to see whether there are opportunities to promote use of this material, such as through the operation of concentration yards.

Concentration yards are not a totally new concept. On a large scale they could be a staging area for the separation of types and sizes of slash materials that could be utilized as solid wood products, such as particle-board products, chips, and energy products. Such concentration

Digitized by Google

yards could be under individual ownership, or owned or managed by industry, and would receive slash not only from the National Forests, but State-managed lands as well as private industrial and nonindustrial forest lands.

We have two major concerns about contracts for slash utilization in the National Forests. We want to be sure that (1) the land and other related resources are not damaged in the removal process, and (2) that some form of compensation is received for the value of the material removed. Contractually, I foresee no insurmountable problems. If the material has no value in place; i.e., "stumpage value," and the area must be treated by either removing the slash or disposing of it in some way, our choice of treatment methods would be governed by which method is most suitable to the local environment.

From an operational point of view we would prefer to have the logger remove the slash in the normal course of the logging operation. This would reduce the impact on other resources and permit reforestation of the area earlier than if the slash removal is contracted separately. I am sure there are good arguments for separate slash removal contracts that deal with the collection and conversion of slash to wood products.

I would also like to mention a few activities we are carrying out to help reduce slash problems. One is a type of prevention technique which helps reduce the amount of slash created. This technique is called "directional felling," and is often referred to as "lining" or "jacking."

Digitized by Google

By mechanical means the trees are guided during felling so that they fall in a direction that will minimize breakage. This results in an additional amount of the felled timber being removed from the area to be utilized at the processing plant and consequently less residue remains in the forest.

Another approach we are developing in the Pacific Northwest is a contract provision to allow stockpiling of cull or otherwise unmerchantable logs in central locations where the material is available for commercial use.

There has been a tremendous increase in the amount of residues being utilized for home heating. In 1974, the Forest Service policy was revised to permit virtually any citizen to be eligible for free firewood. This program has taken a few years to develop, but with the energy crunch it has been on a steady increase. For example, in Fiscal Year 1977, the National Forests in this Region wrote nearly 81,000 free use permits for firewood; mostly residues for noncommercial use. This compares with a total of 25,000 free use permits in Fiscal Year 1974; a three-fold increase in three years. Each permit is good for 5 or 10 cords. However, the total amount authorized for use is seldom fully utilized. We are in the process of acquiring estimates of volumes actually removed in this free use program.

Mr. Chairman, as you can see, we do have the day-to-day challenges of managing and utilizing slash and other residues in the 19 National Forests in this Region and on State and private lands. We believe

Digitized by Google

that H.R. 13324-13832 and the proposed pilot projects will provide new tools for closer utilization of materials left on the forest floor, develop new markets, and add to the economy of rural areas in the Pacific Northwest.

This concludes my prepared statement, and I would be happy to answer any questions.

Digitized by Google

DEPARTMENT OF ENVIRONMENTAL QUALITY

1234 S.W. MORRISON STREET • PORTLAND, ORE. 97205 • Telephone (503) 229-

ROBERT W. STRAUB
GOVERNOR

August 29, 1978

Eugene DEQ Testimony on HR 13832

The Department of Environmental Quality supports research and legislation which would tend to reduce the amount of open burning required by the various agricultural processes. We believe Mr. Weaver's bill represents a straightforward approach to this goal through funding needed project work.

The practice of open burning of forest slash material is a significant source of particulates in Oregon Its impact is dramatic in an aesthetic and visual sense while the impact of ash burning on r qual ty standards is of particular significance in some areas of Oregon where current r quality conditions measure just above or below existing Nationa Ambient Ai Quality standards. that Mr. Weaver's bill points toward a reduction in total emissions, the surest way to reduce man caused air pollution problems, the DEQ wholeheartedly supports its adoption

Though the direct impact of slash burning has been greatly reduced through the efforts of the Department of Forestry Smoke Management Program Sa em and Medford the very difficult problem of drainage winds with their entra ned residual smoke rema ns. Since this smoke is not ventilated away from smoke sensitive areas through the more predictable convective column the DEQ believes the impact of residual smoke is much more closely related to the amount of material burned than is the direct impact of smoke plumes. Consequently, lesser amounts of lash burned should result in a reduced residual smoke problem.

We are encouraged that the bill stipulates "pilot projects for testing and demonstrating practical applications of existing technology for the utilization of wood residues" as there are valuable uses for the slash material using presently available technology. However, the critica. restriction to implementing these alternatives has been economic in nature. The pilot projects and associated funding specified Mr. Weaver's proposed legislation could provide a vital avenue for determining economically reasonable alternative methods of forest slash uti zation Since the ultimate uti ization of slash materials may occur in populated areas the DEQ supports alternative methods of disposal provided their implementation insures the continued improvement of air quality in all areas of the state.

The DEQ supports Mr. Weaver's bill as it would provide an opportunity to develop environmentally and economically sound alternatives to the practice of open burning of forest slash, the reduction of emissions from such burning, long range improvements in air quality, and perhaps other benefits as yet not foreseen.

Scott A. Freeburn

Scott A. Freeburn, Coordinator
Field Burning Program

Digitized by Google

Statement of Joseph Riccio, Oregon State Department of Geology

GEOTHERMAL/WOODWASTE CONCEPT

A preliminary evaluation of the availability of woodwaste, primarily bark, from Oregon and northern California has been made in conjunction with an estimate of the geothermal potential of the Summer Lake Basin which is located in south-central Oregon. The City has applied for non-competitive geothermal leases comprising 23,530 acres in the Summer Lake Area.

Because a recent study entitled "Site Specific Analysis of Hybrid Geothermal/ Fossil Power Plants" by the Public Service Department indicates that a moderate to high temperature geothermal resource can be utilized with a fossil fuel (coal) to a cost and power output advantage, it was thought that, because of the City's leases, a hybrid geothermal/woodwaste plant might be feasible in the Summer Lake Area.

WOODWASTE RESOURCE

Other woodwaste products besides bark, such as sander dust, shavings, sawdust and clarifer sludge (pump mill waste) although available, were not considered as a potential fuel source in this study. Other types of waste materials, such as trea trunks, branches, etc., which are not currently harvested, may be an additional source of fuel. At present, sander dust, sawdust and shavings are used, in part, in the manufacture of pressed-wood products.

Some of the larger mills currently utilize woodwaste as fuel for small, 7 to 12 MW, plants which are the mills' primary source of electricity. Notwithstanding such use of bark and that for horticultural landscaping use, it is believed that 75 percent of the yearly bark production could be available for fuel. It should be noted, however, that because the availability of bark is geared to dressed lumber production, fluctuation in annual bark production can be expected.

Only those mills that produce over 100,000 board feet (BF) of lumber per day and that are served by railroads were considered in this analysis (Figure 1).

Other assumptions also were made relative to the properties of the woodwaste:

Digitized by Google

1. Lumber mills would operate for 230 days/year.
2. Bark has a heat rate of 13,500 Btu/kWh.
3. Bark has a heat value of 4400 Btu/lb (Figure 2).
4. Available bark production in Btu/BF is equal to (5900 Btu/BF) x (75%) or 4425 Btu/BF.

It is estimated, based on data in the Forest Products Industry Directory (1975) that 34 million BF/day of lumber are produced by the aforementioned lumber mills in Oregon and northern California. Hence, the total Btu/day from bark for these mills is equal to (4425 Btu/BF) x (3.4×10^7 BF/day) or (1.50×10^{11} Btu/day). Therefore, the annual potential of these mills from bark would be 3.46×10^{13} Btu/yr. Similar computations could be made for the other woodwaste products. A 10-MW plant that uses bark as its fuel would require 8.7×10^{11} Btu per year (Thiele, 1976). Thus, at least forty such plants could be supplied by the annual production of bark for a total of 400 MW/year.

GEOTHERMAL RESOURCE

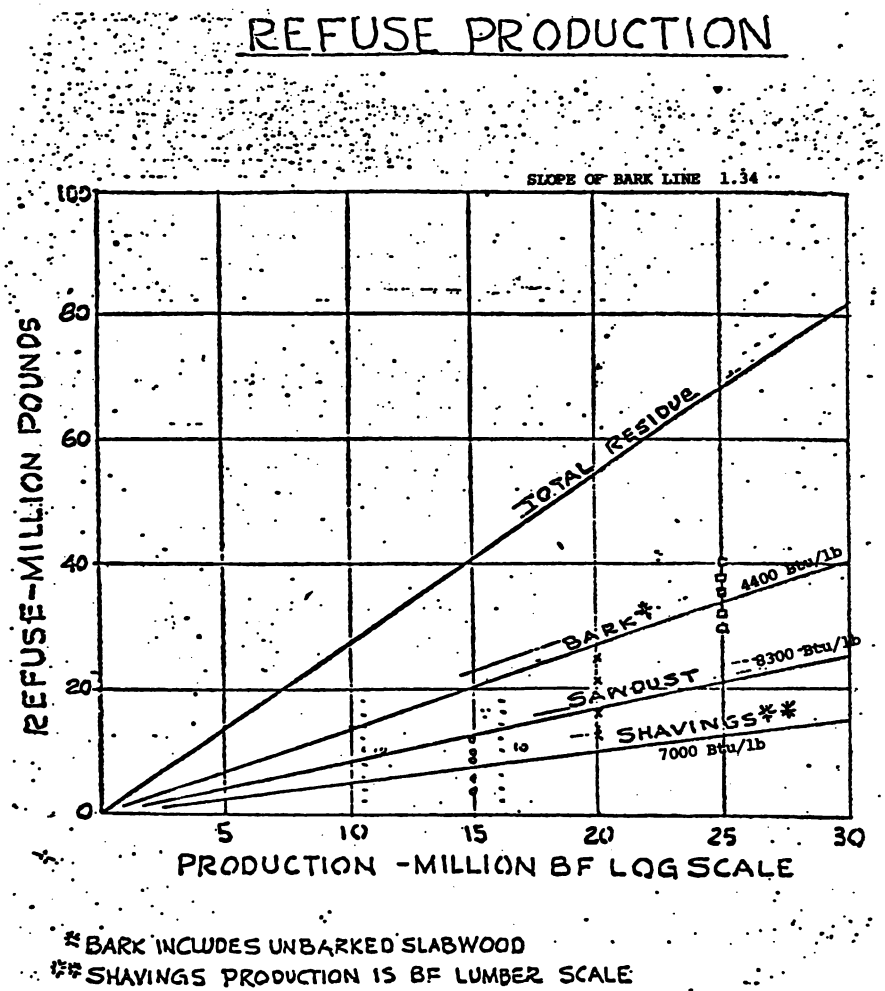
Although exploratory wells have not been drilled to date on the City's leases (Figure 3) or on the KGRA nearby, some data about the reservoir are available from geochemical and geologic studies of the Summer Lake Basin. The geologic data is not herein presented because it is not germane to the geothermal/woodwaste concept at this time.

Based on Na-K-Ca ratios, chemical temperatures of spring and well waters in the Summer Lake Basin are as follows:

Buckhorn Springs	217°C	423°F
Ana Springs	196°	385°
Summer Lake Hot Springs	109°	229°
Wells SS #1 (103 m)	225°	437°
SS #2 (209 m)	196°	386°
SS #3 (76 m)	217°	423°
SS #4 (114 m)	175°	347°
SS #6 (126 m)	186°	367°
SS #7 (41 m)	182°	361°

It is assumed that the geothermal reservoir in the Summer Lake Basin should have an average temperature of about 188°C (370°F).

Digitized by Google



*BARK INCLUDES UNBARKED SLABWOOD
**SHAVINGS PRODUCTION IS BF LUMBER SCALE

SOURCE: Thiele (1973)

Figure 2

Digitized by Google

Total dissolved solids content, based on analyses of waters from representative springs and wells in the Basin, ranges from 161 to 1120 ppm. Although no data on non-condensable gases are available, it is noted that floride (2.2 ppm) and boron (1 ppm) occur in some of the spring waters.

CONCLUSIONS

1. Additional information pertaining to availability and costs of the different woodwaste products and their utility for fuel are needed.
2. Railroad costs for shipment of woodwaste needs to be ascertained.
3. Additional data on the geothermal reservoir performance is absolutely essential. These data will not be available until exploratory holes are drilled, the reservoir delineated and production tests performed.
4. Only when these data are available can a computer synthesis of a hybrid geothermal/woodwaste plant be attempted.
5. If a hybrid plant were to be constructed in the Summer Lake area, sixty miles (±) of new railroad construction would be required from the existing terminus of the Southern Pacific Railroad at Lakeview, Oregon. An alternative method would be the construction of bark storage and loading facilities at Lakeview with the bark delivered to the plant site by truck over existing highways.
6. The City also has applied for non-competitive geothermal leases at Mt. Hood, Oregon. This area was not considered in either evaluation because of (a) lack of any geothermal data, (b) terrain difficulties associated with railroad construction, (c) its location relative to few large lumber mills, and (d) its distance from the lumber mills in northern California.

RECOMMENDATION

1. Additional preliminary investigation into this concept is warranted until such time that economics of either ~~fuel~~ ENERGY source dictate otherwise.

Digitized by Google

BIBLIOGRAPHY

Bureau of Land Management, 1976, Summer Lake Basin Geothermal Leasing, Environmental Analysis Record

Directory of the Forest Products Industry, 1975 Edition, Miller Freeman, San Francisco, CA

Thiele, F. W., 1973, A paper given on Plant Maintenance, Short Course No. 5 for the Wood Products Industry, Pullman, Washington

Thiele, F. W., 1976, Coping with the Variability of Wood Fuels: Paper given at Forest Products Research Society meeting, Spring, 1976

Digitized by Google

Statement of Neil Skill, Director, State Forestry Act

TESTIMONY ON H. R. 13324

Eugene, Oregon August 29, 1978

Our position on H. B. 13324, introduced by Rep. Weaver, is one of support. The Oregon State Board of Forestry and the Department of Forestry have long advocated increased utilization of the material cut from Oregon's commercial forest lands.

This paper is offered as background information to the bill and discusses fuels management and the affect of forest residues on fire hazard, silviculture and air quality.

Fire has been a natural, sometimes destructive component of the Western Oregon ecosystem for as long as forests have been the predominant land cover.

Around 1910 concern of Oregon forest landowners for protecting Oregon forests from fire resulted in the beginning of our present forest protection system. The development of a forest protection capability and the laws to authorize and regulate the protection system has continued to the present time.

Early in this development laws were passed which related to the residue (slash) left after logging. Slash was recognized as an unusual fire hazard, one which should not become a burden on the public as a whole. Resulting forest laws placed a liability upon the owner (and operator) for fire occurring in slash hazard resulting from his logging operation. An owner or logging operator was liable for all firefighting costs for any fire occurring in his slash until relieved of that liability by the Forester. This was often done many years after logging.

33-770 O - 78 - 12

Digitized by Google

In the early days fire risk in slash areas was primarily from lightning or the owners actions and the occasional hunter or fisherman. Today great numbers of people use the forests with no distinction between private and public lands. Fire risk conditions are drastically different. Recently the Oregon Forest Laws were changed to account for the changed fire risk to slash areas. Liability for fire is still the owner's responsibility if he starts the fire, or if he fails to reduce the additional hazard from slash resulting from logging.

Briefly stated, Oregon Forest Laws require the Forester to notify an owner if he has created an unusual hazard; he must tell the owner how to offset or abate the hazard; and he must maintain records holding the landowner liable for any fire control costs until the hazard returns to normal.

Reduction of fire hazard is an objective of the Forester. Hazard reduction can be done by burning, fuel manipulation, fire breaks and by fuel removal. The last, fuel removal, is the most nearly ideal way to reduce fire hazard.

Under the Forest Practices Act, disposal of slash residues takes on a slightly different aspect. Residue removal may be necessary for silvicultural purposes while the major concern is for productivity of the site.

Logging slash, residual vegetation and other debris often hinder establishment of natural reproduction and severely restrict planting activity. Lack of residue treatment favors growth of shade tolerant brush species. Competition for sunlight and soil moisture from residual species often reduce or eliminate the survival of young conifer seedlings.

Oregon Forest Practice Rules recognize slash treatment as a necessary tool for the protection of reproduction and residual

Digitized by Google

stands from the risk of fire, insects and disease, and to prepare the site for future forest production. Fire is only one of several treatments that are recognized in the Forest Practices Rules along with mechanical and chemical treatments. In any case, the purpose is to minimize logging residue and competing vegetation on timber growing sites. Additional residue removal will help. A final key concern of the Forest Practices Act is to minimize any adverse effect of site treatment measures on areas outside the units being treated.

Stated earlier, fire is still a natural part of the ecosystem. Its role has been and can be manipulated by man. In some parts of Eastern Oregon the exclusion of fire has resulted in brushy stagnant stands of mixed species which has virtually destroyed the game habitat and grazing potential and has severely reduced timber production while greatly increasing the potential for a disastrous fire eventually. In Western Oregon fire remains the best tool available to insure a desirable species can be regenerated on most forest sites. Fire reduces barriers which include logging residue, extensive duff layers, and root mat and at the same time kills back competing vegetation.

There are few alternatives to burning on many sites. Machine removal is not possible except on very favorable slopes. Hand brushing generally results in extensive sprouting and a worse condition than existed before brushing. Herbicide use is often less desirable than burning. Again, we can say that increased wood residue utilization will in some instances reduce the need for burning and will in many cases substantially reduce smoke production from those units which must be burned.

Digitized by Google

Statement of Jerry Rust, Lane County, Oregon, County Commissioners

I am Jerry Rust, Chairman of Lane County Board of Commissioners, and I am here speaking in support of HR 13832. This bill is potentially a strong one. It is a bill that has long been needed and has a possibility for accomplishing the stated principles of the act. Pilot projects for testing and demonstrating the use of wood residue are vital in enhancing air quality as well as making use of now-wasted resources.

I would like to offer several strengthening amendments which I believe could aid the Congressman in meeting the intent of the bill as I understand it. I suggest including the following points, perhaps under Section 2A:

1. That an effort be made to high-grade hardwoods or other woods which may be of a higher and better use than fuel. There are many woods in our forests which do not get utilized because of various factors. Woods such as yew, maple, and chinquapin are valuable as hardwoods which could be finished at the local level into high-quality furniture, panelling or other related hardwood-type use.

2. That a pilot project be undertaken that would make firewood available to seniors, or others who are unable to travel extensively over rougher mountain roads, by placing the materials in central locations at lower elevations. It would enable senior citizens and others with small pickups and chainsaws to obtain a cord of wood easily and safely.

3. I think, also, in Section 3A, in speaking of authorizing the Secretary of Agriculture to "sell or otherwise dispose of wood residues " I should like to offer a suggestion that would give preference to pub c bodies such as PUDs, rural electric coops or municipal bodies to such fue materials. I base this on historic preference principles uch as embodied in the Bonnevil e act which makes the public resource of the Columbia River available to the public bodies. This should also be done on the basis of a 20-year contract; this is because any public or private body could not afford the capital costs of a generating system unless there was assurance of a long-term contract. The present Forest Service method of disposing of slash and marketing it precludes this potential. think that language should be further added that "if there shall be conflicting or competing applications for an allocation of wood residue between any public body or cooperat ve on the one hand and a private agency of any character on the other, the application of such public body or cooperative shall be granted." Th s language is, of course, lifted from the Bonneville principle of giving preference to the public bodies.

   A further amendment for your consideration would read: That a hierarchy of allocation be established in accord with the above principles--first preference to woods suited for a higher and better use than fuel, second preference to easily accessible firewood, and third preference to public bodies for electrical generation.

   Once again, I commend Congressman Weaver for his leadership and his effort in presenting this bill to the Committee. I sincerely hope that these proposed amendments will be considered. I assure the Congressman that Lane County would be willing to assist in any way possible the utilization and implementation of the act.

Sincerely,

Jerry Rust

Jerry Rust

Digitized by Google

MEMORANDUM

lane county

FROM Virgel L. Clark - Director of County Forestry Program

SUBJECT Presentation to Representative James Weaver - "Wood Residue Utilization"

DATE Aug. 29, 1978
1:30 p.m.
Eugene City Hall
WP 7669-67

The following presentation was made at the hearing which was chaired by Representative James Weaver.

order to bolster the economy of Lane County, as well as the State of Oregon, the use of the natural resources from our forests must be intensified. This does not mean the cutt ng of more trees or pressuring the BLM or US Forest Service to sell more timber sales. It does mean, however, that we must work out a practical, economical and profitabl method of technology to ut ize all of the wood fibre that is in the trees which we are harvest ng today. If the forest products industry actually utilizing all of the wood fibre that s available in the logging slash and other sources, only then can we make ourselves heard when we des re additional timber sales. Based on our cursory examination of USFS, BLM and private logging slash areas, it appears that there is ample unused wood fibre to serve as resource base to one, or possibly two, chemical oriented manufacturing plants here in Lane County.

A plant that is envisioned will use the logging residue or other resource waste material will probably not be economically viable if it produces a single finished product and not totally consume the entire wood fibre The most viable type of a manufacturing unit will use the entire wood resource and produce a line of products and there wil be no residue waste. As an example:

1. The primary process wi produce ethyl alcohol. This product can be used as a fuel (energy) supplement for transportat on or other applications where carbon products are now being used, e.g., gasoline, diesel, kerosene, jet fuel, or straight alcohol consumption, etc.

2. The secondary process will produce adhesives as end products. Adhesives derived from wood fibre (lignin) have proven to be economically feas ble and desirable. This adhesive product may be used in most any technological process where high qual ty adhes ves are required. Thi product could replace several types of adhesives which are now being manufactured from carbon based materials.

3. The tertiary process could use the residue from the prior processes as a resource base to manufacture a type of solid panel or, if it is more profitable, the residue could possibly be used in the oil drilling industry, sweeping compounds, boiler fuel, briquets or horticulture mulching materials.

The accumulation and transportation of the wood resources to the manufacturing center is envisioned to be a composite activity. There should be large type

Digitized by Google

vehicles and a far greater number of smaller type vehicles delivering the wood or chips to the plant. This should be planned and implemented in such a manner that the very small independent contractor, using labor intensive methods, should be able to participate in a profitable manner. From the fragmented and cursory information that I now have, it appears that a viable and profitable operational plant would need to consume the minimum of 1,000 tons of "wet" wood fibre per 24 hours. This should result in approximately 50,000 gallons of ethyl alcohol.

The total direct labor input to a manufacturing facility of this type, from the forest to the finished product, should not be less than 600 persons.

The wood utilization operation should not be a government operated unit. The government should, however, provide the initial experimental model and provide the guaranteed long-term resource base or agreement with the BLM and/or the US Forest Service.

The plan of endeavoring to implement a suitable profitable method of utilization of the, now, unused wood fibre will not "get off the ground" unless there is some type of guaranteed long-term resource supply with a definite cost per unit formula.

Assuming that the utilization plant is actually implemented and using the available wood fibre, then some "foreign" purchaser desires to come in and buy chips for export at a very high profit level, this will cause a real resource problem unless such an action is foreseen and is covered in the resource base agreement.

V. L. Clark

VLC:js

Digitized by Google

Statement of Bill Norwood
Director of Physical Plant
University of Oregon
Eugene, Oregon

CLEAN STACKS SAVE MONEY

At the University of Oregon we are living in the best of all possible worlds - one that is both clean and profitable! By filtering our power plant stack emissions, we clean the air and we are in a position to save money in the process. While we feel that we have a very unique situation — for instance, we burn hog fuel, a waste product from Oregon's forest industries rather than fossil fuel -- many of our ideas can be of benefit to heating or power plant operations in many of the institutions represented in this room.

The heating and power plant at the University consists of one 110,000 lb. suspension fired boiler, and three 35,000 lb dutch oven boilers. Two 1250 ton litheum bromide chillers and three turbine generators - one 2500 KWH and two 1500 KWH -- round out our major equipment installations. This plant provides the heating for 34 major buildings, as well as several minor buildings on campus. It provides all of the air conditioning chilling and approximately 60 percent of the institution's electrical needs. Until 1972, the plant supplied 100 percent of the electricity required on campus. At that time, however, expansion of campus facilities without comparable expansion of the power plant exceeded our capacity and a portion of our electrical needs is now supplied by the local utility board.

In 1973 we were confronted with a problem. It became evident that in order to continue to operate within the limitations of the Federal Pollution Controls, it would be necessary either to operate our boilers at a low efficiency rate (approximately 70 percent of capacity) or to clean stack emissions in some manner. About that time the University learned that the Combustion Power Company of Palo Alto, California, had developed a pollution control system that might meet the University's needs without creating excessive maintenance problems or exceeding the University's financial limitations. A pilot model of a dry scrubber invented by Combustion Power Company was then being tested at a

Digitized by Google

Weyerhaeuser Plant in Snoquolmi Pass near Seattle, Washington. After studying this device, as well as a number of wet scrubbers, and electronic precipitators, we decided to install the first full scale dry scrubber of this type. The unit went into operation late in the summer of 1977. It consists of a cylindrical tank with an inverted cone at the bottom. The tank stands approximately 70 feet high and is 14 feet in diameter. The outer tank jacket receives the smoke which then passes through a ferated metal screen, 18 inches of gravel (somewhat smaller than pea gravel), another screen and then into the exhaust chamber. As the smoke is pushed and sucked through the gravel bed, the fly ash residue is deposited on the gravel. The cleaned air is then released through the stack. The gravel is in continuous motion. As it settles to the botton of the cone, it travels across a vibrating screen which separates out the fly ash. The fly ash travels into a depository while the cleaned gravel is deposited into an elevator and carried to the top of the tank to repeat its cycle. It takes approximately 10 to 12 hours for the gravel to complete one full circuit. The degree of cleanliness of the "smoke" emitted depends upon the volume of air that passes through the gravel bed. The stack emissions, after scrubber processing, can meet any of the present-day clean air requirements.

The simple operation of this scrubber is its chief attraction. There are only three moving parts in the scrubber: (1) the vibrator screen, which so far has given no problems; (2) the elevator, which has given no problems, and (3) the turbine that powers the fan to suck the stack gases through the gravel. The turbine was deliberately selected as the fan's power source rather than generating electricity and transferring it to the fan. This has saved a certain amount of energy and so far has been without any major problems.

After planning the scrubber installation, we considered disposal of the fly ash residue. The ash travels through a drag chain conveyor, an elevator, and a

Digitized by Google

screw conveyor and is finally deposited in a 40-foot semi-trailer van. This trailer has been modified with a special rear door and a sheet iron lining to reduce fire danger. The fly ash material extracted from the stack gas is extremely fine, about the consistency of talcum powder. This black powder is very dirty and creates quite a problem for the workers. If left in the open air, it creates a considerable mess. Because of this, the entire fly ash system has been enclosed and there is no appreciable amount of ash visible around the scrubber. The material is extremely fluid, and the fact that there is only one opening in the center of the 40' trailer presents no problem. The angle of repose is extremely shallow. When loaded, the center of the load is only two or three feet higher than the ends.

The University of Oregon is negotiating a contract with the Kingsford Charcoal Briquet Company for its use of the fly ash as one of the major additives in the making of charcoal briquets. The material does have a volatile content of 12 to 14 percent. If our negotiations are successful the University will receive $15 per ton for fly ash plus the cost of hauling.

At the present, approximately 25 tons of fly ash are being produced within a 10 day period. As more boilers are tied into the present system, this production will increase. Only two boilers are being funnelled through the scrubber. It appears that the other two - depending upon the firing loads - may also be accommodated.

The dry scrubber is proving to be a very valuable addition to the power plant operation.

The stack gas, as it leaves the scrubber, is being routed back to the ground and disposed of through a stack further down the line. The gas, as it leaves the scrubber, is approximately 450° F. In the past this heat has been dissipated into the atmosphere. Even though capturing that heat was not an original part

Digitized by Google

of the scrubber project, heat recapture has been planned for. The stack gas will be routed through a heat transfer unit. Construction of this additional project is now under contract. The estimated cost of installation of the unit itself including the coil, piping and insulation is $140,000. As the gas leaves the transfer unit, its temperature will have been reduced by approximately 200°. This recaptured energy will produce 20 lbs. of steam, which in turn will be piped into the power plant and used to preheat the boiler feedwater to approximately 225°. The dollar savings for this operation is expected to be approximately $48,000 annually. After the stack gas leaves the first stage heat exchange unit, at approximately 250°, it will enter the second exchange unit and leave it at approximately 225° and then it will be sent into atmosphere. The second unit will generate hot water to be used in the chiller operation. As indicated earlier, the plant includes two 1250 ton litheum bromide chillers. In the past they have been operated by steam. Our present plan is to convert them to steam or hot water operation. The estimated cost for this conversion is $250,000. When this is completed, the hot water from the second stage hear recovery unit will be used to energize the chillers. The University of Oregon generates chilled water 12 months a year for various functions. It appears that this second stage recovery unit will operate the chillers for the equivalent of seven months or our total 12 month need at an annual dollar saving of $30,000. Both heat recovery units will be operated at no additional cost in energy over and above the existing operation of the scrubber. We anticipate there will be certain maintenance costs that are not evident at the present time. The two hear recovery units will generate a total savings of nearly 25 percent of the Power Plant's annual fuel consumption.

The scrubber was purchased as a package unit from the Combustion Power Company at Palo Alto, California. The design and construction was completed under the guidance of Marquess and Marquess Engineering of Eugene. This firm

Digitized by Google

should receive credit for many of the innovative ideas and unique features of the overall system. The total cost of the package unit and its installation, excluding the collection system, did not exceed $300,000. The collection system was developed in house and cost approximately $50,000. The major item in the collection system was the purchase of the trailer van for $2500. The total cost of the completed package was $350,000.

Don Kroeker (now retired) of the Kroeker Engineering Company of Portland, Oregon, should be recognized for developing the original heating and power plant concept. Since then, many additional ideas have been developed through the ingenuity and diligence of members of the University of Oregon Physical Plant staff.

We of the University of Oregon feel that we now have cleaned our stacks in a responsible and responsive manner. We save money in the process and we are proud of our accomplishments. We are willing to share all of the ideas we have developed with those who are interested. We believe additional professional critiques of our operation can only enhance our service to the University and help us to be a better neighbor in Eugene. Our plant is open for inspection during the normal work week. We invite all of you to visit us.

(Attachments are held in the subcommittee file.)

Digitized by Google

TESTIMONY OF CAMILLA PRATT, COMMISSIONER, EUGENE WATER & ELECTRIC BOARD

For many years, logging residue has been collected and burned—wasted. This practice now costs the Forest Service over $250 per acre.

Aside from the wastefulness of this forest management practice, slash burning is a major contributor to the serious air quality problems of the Eugene-Springfield and Medford areas. Many people find slash burning smoke far more initiating than the smoke and ash from grassfield burning—due to aromatic chemicals and very fine particles, which can be deeply inhaled. These chemicals and particulates are the products of one-site, open burning of logging residues.

However, wood waste makes good boiler fuel. EWEB has been generating steam for district heating and for electricity generation for over 35 years—using mill wood wastes. That hog fuel was free in the early days of steam plant operation. Now EWEB pays over $6 per unit for that fuel. Two years ago the price for hog fuel was just slightly $5 per unit. Oregon has many wood boilers—and they depend on a reliable source of relatively cheap fuel.

Finally, those of us who oppose further building of nuclear generating plants should be very enthusiastic supporters of all alternative energy sources—geothermal and the various forms of solar energy, including this biomass resource at issue today.

Cost effective utilization of our wood residues is an easy alternative to support. Needed energy can be produced and our air pollution problems can be alleviated.

Without further delay, we must develop economic methods for recovery and utilization of a great, presently wasted, resource.

Congressman Jim Weaver's bill, the Wood Residue Utilization Act of 1978 is the key to accomplishing this goal and his bill has my whole hearted support.

STATEMENT OF VERNER J. ADKISON, DIRECTOR, LANE REGIONAL AIR POLLUTION AUTHORITY

Thank you for giving the Lane Regional Air Pollution Authority an opportunity to speak to the local air quality conditions as they relate to forest slash burning. Though brief, I hope my testimony will give you a better understanding of the importance of slash utilization as an alternative to slash burning, from an air pollution standpoint.

As a prelude to my remarks, may I state for the record that the Lane Regional Air Pollution Authority is a local government agency formed to protect the air quality in Lane County, Ore. It is an enforcement agency with the responsibility to develop and enforce air pollution rules and regulations and to implement air quality programs that would enhance the cleaning of the air in Lane County.

Though slash burning in western Oregon is a program conducted by the State department of forestry and thus, does not fall under the jurisdiction of the Lane Regional Air Pollution Authority, the agency views slash burning as a contributor to the Eugene/Springfield air quality problem.

The Eugene/Springfield area has been federally designated an air quality maintenance area due to continued violations of the Federal standards for total suspended particulate, carbon monoxide and photochemical oxidants. It is the suspended particulate problem that I will address this morning.

Slash burning is a suspened particulate source. Because of this fact, and because slash burning is a widespread practice in the Federal, State, and private forest lands adjacent to the Eugene/Springfield metropolitan area, the Lane Regional Air Pollution Authority would like to see this burning practice cut back as much as possible.

The Environmental Protection Agency, in a March 1977 report entitled "Technical Support Document on the Phasedown of *Oregon Open Field Burning*," determined that the total suspended particulate contribution from slash burning is, on the average, between 3 and 15 micrograms per cubic meter during a typical 24-hour period when slash smoke is impacting the Eugene/Springfield area. Micrograms per cubic meter is a weight measurement calculated from a standard high volume sampling machine which collects particles on a piece of filter paper.

The final conclusion of the report stated: "Slash burning emissions may be, on occasion, a major contributor to total suspended particulate concentrations in the Eugene/Springfield area."

The Lane Regional Air Pollution Authority has officially recorded 42 separate days in the past 2½ years when violations of the Federal 24-hour total suspended

Digitized by Google

particulate standard were recorded. Those violations are based on a weight standard of 150 micrograms per cubic meter of air.

Of those 42 violation days, 12 occurred on days when a significant amount of slash burning took place. Those 12 days were: February 4, 1976, September 24, 1976, September 28, 1976, October 27, 1976, January 7, 1977, January 25, 1977, February 18, 1977, October 13, 1977, November 8, 1977, November 9, 1977, November 10, 1977, and March 17, 1978.

In addition to a violation of the weight standard, each of the above days recorded at least a minimum visibility of 12 miles. A minimum of 1,000 tons of slash was burned in lane and adjacent counties on those days.

Visibility is significant in that it indicates the amount of fine particulates in the air. And, fine particulates may constitute a definite health hazard due to the fact that they are more easily respirable than the larger particles. Slash burning emits fine particulates.

Based on this information, the Lane Regional Air Pollution Authority has concluded that slash burning was a significant contributor to the poor air quality in Eugene/Springfield on those 12 days.

The most recent significant slash burning intrusion occurred on August 2nd and 3rd of this year, although a violation of the suspended particulate standard was not registered.

Considerable slash burning took place in the coast range on that day. Very little field burning was conducted. Visibility at our monitoring station on the roof of the Lane Community College Building in downtown Eugene was down to 2 miles at one point. One can assume, therefore, that there was a high amount of fine particulates in the air at that location.

The Lane Regional Air Pollution Authority recorded more than 125 citizen complaints associated with that intrusion.

Let me reiterate that the particulate emissions from forest slash burning are fines, meaning that they are very small particles of low density, weighing very little. Though they may not contribute much in terms of the existing weight standard, they may constitute a significant health problem due to their small size, in that they are easily respirable.

Aside from the health aspect, smoke from slash burning, such as occurred on August 2nd and 3rd, constitutes an aesthetic air pollution problem—destroying, at least for that day, the natural beauty of our area.

The Lane Regional Air Pollution Authority has taken a public position that each contributor to Eugene/Springfield's suspended particulate air pollution problem must be expected to "bear its fair share" in any rollback strategy that is developed. We have maintained this position with respect to Willamette Valley field burning. We will expect no less from slash burning.

In summary, the Eugene/Springfield metropolitan area has been designated a nonattainment area for total suspended particulate, due to our continued violations of the Federal particulate standard. Considerable slash burning has taken place on at least 12 days in the past 2½ years when this area has officially violated the standard. Other instances of slash burning intrusions have occurred on days when the standard was not violated. Slash burning emits fine particulate matter. While such fine particulates may not contribute much in terms of the Federal weight standard for total suspended particulates, they may well constitute a health problem for the citizens of this area. At the very least, smoke from slash burning presents an aesthetic problem to Eugene/Springfield citizens.

Slash burning is a suspended particulate contributor. When a control strategy designed to bring this area back into compliance with the particulate standards is developed, slash burning must account for its "fair share" of the contribution to Eugene/Springfield's air pollution problem.

Increased slash utilization means decreased suspended particulate pollution from slash burning in the Eugene/Springfield area.

Thank you for giving me the opportunity to speak with you today. I would be most happy to answer any questions you might have.

STATEMENT OF JOHN M. LYNN, PRESIDENT, FISHER STOVES INTERNATIONAL, EUGENE, OREG.

A few facts for the record and then I would like to respond to any questions you may have.

Digitized by Google

The woodburning stove industry is very fragmented and it is difficult to obtain complete data on the total unit sales. But based on a recent industry survey by four Oregon based companies with approximately 50 percent of the national market for efficient solid fuel virtually air tight stoves, it is currently running at 400/500M units p.a. with a potential by 1981 of 800/900M units p.a., if a tax credit is granted under the House energy bill (H.R. 5263), or the residential tax credit portion of H.R. 112, which was amended and passed by the Senate last week.

We predict sales of approximately 5.5 million units between 1978 and 1985. These units would consume approximately 76.8 million cords of wood during this period based on 3 cords p.a. per unit.

Area consumption based on our sales data is 29 percent Western and Rocky Mountain States, 17 percent Central and Midwest, 37 percent Southwestern and 17 percent Northeastern.

Wood lengths vary depending on the stove model but generally speaking can be as short as 12 inches and as long as 40 inches. Diameter can vary to very small to very large due to splitting. Firewood costs vary substantially but for softwood run $30/$40 per cord already cut and delivered, to substantially less for those willing to do their own harvesting on either public or private lands. In general we say the user of an efficient, virtually airtight, appliance can save 50 percent or more on their heating bills.

On the issue of pollution, most of the solid fuel appliances run in the 50 to 80 percent efficiency range so combustion is fairly complete leaving little ash residue. A 1976 leaflet, No. 559 from the U.S. Department of Agriculture Forest Service, advises that wood is much lower in irritating pollutants than most fuels, has low ash content, and what ash remains can be used as fertilizer. They stress the renewable aspect of wood and if used as fuel would reduce the burdensome pile of wood waste riddling our environment in woodlands, rural dumps and wood processing plants. The publication, "The Complete Book of Heating With Wood" by Larry Gay, states "the slow smokeless burning of decay," to borrow Robert Frost's phrase, is slow oxidation under the influence of microorganisms and fungi; combustion is fast oxidation. Complete oxidation of wood is the reverse of photosynthesis, the major products being carbon dioxide, water and energy as heat instead of light. These are the products, whether the oxidation occurs on the forest floor or in the firebox of a stove. Thus burning of wood does not lead to a net increase of atmospheric carbon dioxide, in contrast to coal and oil, since the carbon dioxide would be liberated in the forest by decay anyway."

A detailed study of the air pollution potential of small wood stoves is now being finalized by Prof. Samuel S. Butcher as a visiting scholar at the Institute of Environmental Studies, University of Washington.

On the issue of employment, a February 1978 report by Brookhaven National Laboratory under contract with DOE assessed implications of employment on conversion of approximately 8 percent of New England homes to wood burning and found that additional jobs created in the cutting and transportation of wood would create from 13,000 to 19,500 jobs. This only covered the direct employment impact.

Digitized by Google

TESTIMONY ON BEHALF OF ASSOCIATED OREGON INDUSTRIES
ON H.R. 13324

Eugene, Oregon
August 29, 1978

Associated Oregon Industries appreciates this opportunity to comment on H.R. 13324. We have long been interested in forestry and energy issues and would like to outline what we view is a rational approach to the issues which your bill addresses.

Over the past decades, the forest products industry has greatly expanded its use of residues and species which were once considered useless. In fact, the particleboard, hardboard, insulation board and paper industries have been built on residue usage in the West. This has been an evolutionary process and this process is continuing. It is a direct response to market conditions and technological change and everyone--consumers, investors, employees and local governments--has benefitted. Simultaneously, in response to rising energy costs, many residues have a higher economic value as fuel than for product components, and, therefore, substitute for fossil fuels. Some estimates indicate that wood currently constitutes as much as 5% of Oregon's total energy consumption. This use is primarily by the forest products industry and consists mostly of residues available at the mill sites. There are few such residues which go unused.

To provide the framework for a rational use of additional wood residues, including slash, we believe the following actions are needed.

1. Usage of wood as fuel requires a significant capital investment by users. Such investment is motivated by marketplace signals and constitutes private risk-taking after careful consideration of other

Digitized by Google

investment alternatives. If oil and natural gas were deregulated. interest in wood waste as a fuel would increase. Without deregulation, there is no way to accurately determine what resources should be used, where they should be used and in what quantities.

2. Residues from logging operations of private companies are declining as cutting cycles are shortened. The physical volume of unusable wood is much less than it is on federal lands. The same decline will occur on federal lands as these lands enter their second cycle.

3. Investments in boiler equipment currently require a 22-year depreciation period. Forest Service policy, however, makes such long-term investments extremely risky. Until RARE II is finalized and Wilderness discussions concluded, there will be little interest in private sector investment when the viability of that investment is dependent on a resource over which private ownership cannot be established.

4. Prior to any efforts to promote wood as a fuel for the generation of electricity, we believe it would be worthwhile to reanalyze the cost structure of various alternatives. While there is a great deal of discussion regarding the merits of small generation units, we believe that it is time to take a close look at both capital and operating costs of all generation possibilities.

In summary, we visualize an important role for government but it is a role which removes constraints to orderly and economic resource usage, not the launching of new utilization programs. Actions that the

Digitized by Google

government can take to encourage private sector interest in greater wood waste utilization is of course the deregulation of oil and new natural gas. In addition, government policies on timber and timberlands should be directed to reducing residue volumes by practicing more intensive forestry on lands where timber production offers the highest potential and by adopting a harvesting schedule that reduces the long-term volumes of dead and dying timber. The federal government should concentrate its efforts on management of the resources it owns, not involve itself in programs which determine how the resource will be used. With sound policies, the latter will be dealt with effectively by the marketplace.

33-770 O - 78 - 13

Digitized by Google

Statement of Jim Fowler, Bio-Solar Research and Development

In early 1977 Bio-Solar was awarded the U.S. Patent for the process of converting virtually any form of fibre into a fuel pellet which is non-polluting and burns at approximately 9,000 BTU's per pound.

Since that time four plants with a daily production capacity of about 250 tons have become operative, two in Oregon, one in California and one in Tennessee. Currently, there are seven plants under construction and another ten or more planned for the immediate future.

Woodex pellets have been used successfully in place of coal for about two and one-half years at Western State Hospital in Steilacoom, Washington. Kingsley Air Force Base at Klamath Falls, Oregon has permanently converted to Woodex following a successful test during which there were no emissions and the entire central heating system used only one boiler instead of two as when burning coal.

Tests have been made throughout the nation---Vermont, North Carolina, Tennessee, Michigan, California and numerous tests in Oregon. There has yet to be the first failure.

One of the most significant tests was conducted at our research and development plant in Brownsville in which 48 tons of bagasse---sugar cane residue---were converted to Woodex pellets. Since, arrangements have been made to build at least two and possible more plants in Hawaii to convert bagasse to fuel pellets, thus cleaning up the environment, providing a much more efficient fuel and obviating the need for importation of

Digitized by Google

fuel oil. It is not unreasonable to assume that pellets will be used by sugar refineries all over the world in a very short time.

Although many types of fibre--peat, straw, secondary sewer sludge, walnut shells--have been successfully converted to fuel pellets, the primary raw material to date has been forest waste.

The primary reason Woodex and Bio-Solar is located in Eugene is the ample supply of wood waste from the forest products industry.

Forest slash has not been converted in any significant amounts primarily because of present cost resistance. There is no doubt that the cost of gathering, chipping and hauling forest slash would exceed today's cost of hogged fuel. But this vast source of raw material someday will be economically attractive.

Already the cost of coal has increased substantially. In the State of Washington, coal users are now paying about $43 per ton as opposed to about $32 only a short time ago. It is safe to assume we will be paying a great deal more for imported petroleum in the near future.

As these fossil fuel costs rise, the millions upon millions of tons of forest slash will become increasingly attractive.

There is another element of forest slash economics which should be considered.

Digitized by Google

In late July and early August--during our unseasonal hot spell--forest fires spread throughout the Pacific Northwest. In Oregon there were some 12,000 acres destroyed by fire. It has been acknowledged that many of these fires were started where slash was being burned and got out of hand.

During the peak of the fire season over one thousand men were on the line. I don't pretend to know the economics of fire fighting, but a safe guess is that it cost at least $100 per day per man to feed, house, pay and provide equipment. If this figure is reasonable then it cost $100,000 a day to combat fires. Don't consider the economic value of the fibre which went up in smoke and ashes which could have been converted into a non-polluting fuel.

Just supposing that $100,000 a day to fight forest fires had been spent to clean up the slash, chip it in the woods and haul it to a pelletizing plant to make fuel pellets.

Even at $40 per ton, this would be 2,500 tons of chips, which would be equal in BTU's to 87,500 barrels of oil--which at $14 per barrel would amount to $1,300,000.

We estimate it would require about four acres of forest slash to supply a 250-ton a day pellet plant.

The 12,000 acres of forest destroyed by fire in less than two weeks would produce 750,000 tons of fuel pellets, which is equal to 2,625,000 barrels of crude oil. Again at $15 per barrel, this would amount to almost $40 million.

Digitized by Google

Statement of Gerald J. Gruber, Eugene District Forester, Industrial Forestry Association

The forests surrounding the Willamette Valley contain some of the finest timber growing sites in the world. The timber is less defective and much of it is in younger age classes than stands in Southwestern Oregon. Logging residues still create problems only slightly less troublesome than those you heard about in Medford.

In the competitive climate existing in the timber industry, there is constant pressure to improve utilization of our basic raw material. If a company is to maintain a competitive position it must get as much or more from every tree harvested as the company which is bidding against it for the available timber. Small log mills and chipping facilities are now located close to most of our forests and more will be built as it becomes economically feasible to bring this material out of the woods.

Most of our timber harvest comes from old-growth forests. Such stands contain much defective material which with the large limbs in the tops create residue problems. Even so, our utilization standards have improved each decade. During the 1950's on industrial tree farms in the Douglas Fir Region, approximately 44 per cent of the area clearcut was burned to prepare the ground for planting of a new crop of trees. In the '60's this percentage dropped to 33 per cent and so far in the '70's it is averaging 25 per cent. Small diameter logs and cull material are being hauled to processing plants and made into lumber, plywood and chips for pulp production. As we convert our timber stands to second growth even a higher percentage of harvested areas will be suitable for replanting without further treatment.

Slash burning is still a valuable tool of forest management. There is no other way to properly prepare some sites for reforestation. Smoke management policies are working, keeping smoke out of populated areas. New techniques such as helicopter torching and spring and summer burning are helping get the job done regardless of weather conditions.

More restrictive clean air standards will lessen our ability to get the job done. Government agencies should cooperate in setting reasonable standards. We now have restrictions on slash smoke drifting over National Parks while a wildfire in Crater Lake National Park is allowed to burn with no effort made to control it.

If we are allowed to properly manage our forests using precommercial thinning, brush control with herbicides, fertilization and genetic improvement, our utilization of each tree will become more complete. In the future we may need some such wonderful machine that inhales tree tops and spews out neatly tied slash bales or pellets ready for transportation to a power generating facility. Our research money today should be concentrated on growing, harvesting and assuring a new crop of trees.

If additional material from timber sales can somehow be economically utilized to produce wood or paper products the timber industry will find a way to do it. We do not need Government funded experiments to point the way.

Digitized by Google

NORTH WEST TIMBER ASSOCIATION
1355 OAK STREET • P.O. BOX 5554 • EUGENE, OREGON 97405
TELEPHONE: (503) 686-9603

STATEMENT OF MARTIN DEVERE
BEFORE THE
FOREST SUBCOMMITTEE OF THE
HOUSE OF REPRESENTATIVES AGRICULTURE COMMITTEE

REGARDING HR 13324
THE WOOD RESIDUE UTILIZATION ACT OF 1978

August 29, 1978 - Eugene, Oregon

Congressman Weaver, I am Martin Devere with North West Timber Association, Eugene, Oregon.

Our membership is composed of small and medium-sized independent operators throughout western Oregon. We produce approximately 1½ billion board feet of lumber and plywood annually. We are nearly 100 percent dependent upon Federal timber for our raw material supply.

Since many of the proposals in your bill, HR 13324 would have a direct effect on the operation of our members we are extremely interested in this piece of legislation. I wish to commend you, Congressman, for recognizing the need to develop methods of reducing the residue generated through timber harvesting and the manufacture of wood products. It is a problem I have dealt with personally for well over 10 years. It began when an employer I had gave me the responsibility of doing something with their sawmill waste, when the teepee burners were torn down. I spent well over a year in research, looking for the best method from the standpoint of efficiency and economic return, to deal with these residues. We explored everything from charcoal and soil conditioners to the possibility of making breakfast cereal. Believe me, I fully appreciate the problem you are trying to solve and before these days of testimony are completed you will begin to realize its magnitude.

Digitized by Google

Over the past several years, a large number of pamphlets, books, and studies have been written on various uses for logging residue. The conclusions all seem to be the same. When the economics of utilization are right the residues will decrease. We have seen this already in the rise and fall of export chip markets. Just a few years ago when chip exports had reached an all time high previously unusable YUM piles were being sold competitively by the Forest Service. Currently I am told the export inventories of usable chips range from 4 to 6 months and therefore chip demand and the conversion of YUM piles is quite low.

The projects your bill is aimed at should be geared to recognize the volume of material that needs to be dealt with. The Forest Service estimates that there are currently 25 million tons of uneconomical forest residue left in the woods each year. Pilot projects established under this act should, in the main, be ready to deal with that type of volume and not waste efforts on small make-work projects which will have little or no value in the actual reduction of massive residue material.

Another consideration must be what the Forest Service will do in establishing slash disposal requirements on future timber sales where funds from this act are incorporated. Since brush disposal is calculated as part of the timber sale appraisal increases in slash disposal costs will necessarily reduce the appraised price of the timber and therefore have a direct effect on county revenues. A relationship must be developed between the advantages to the county of reducing the residue in the woods and reduction in their timber receipts income.

I strongly believe that if economically feasible and profitable residue reduction programs are developed through this act, the appropriated monies should not continue to be used to add to those profits.

Digitized by Google

Reaction Products, Inc.
(503) 746-8821

P.O. Box 311
Springfield, Oregon 97477

My name is Jim Lang, I reside at 2936 Manor Drive, Springfield, Oregon, and I am Chief Executive Officer and Vice President of Environmental Research of The Solar Fuel Company of Minnesota.

I am here to speak in favor of, and urge the passage of, this slash utilization bill, H R 13832.

My company has, in June 1978, been issued U.S. Patent # 4093516 and U.S. Patent # 4094740. These patents teach/describe a process to produce ethanol for use as motor vehicle fuel, from unwanted sewage sludge, grass straw, slash, municipal solid waste, cannery waste, and any other organic wastes.

In this area, the largest source of waste cellulose is from wood, wood products and logging industries. I would like to utilize this waste wood to produce ethanol, to extend our national supply of motor vehicle fuel.

For the past two months, I have contacted big private industry, little private industry, the County Forestor, the State Forestry, the U. S. Forest Service, the BLM and any one else that I could talk to trying to find out what the cost of this waste cellulose, as feedstock for an ethanol plant, would be. I have not been able to come up with any cost estimates.

There seems to be quite a negative attitude towards taking slash out for utilization. I would acknowledge that much of the slash appears to be in terrain too rough to economically recover. But that is what this bill is all about, obtaining cost data by actually doing it.

Among the objects of this bill are (2) develop alternate sources of energy (3) reduce the hazard of forest wildfires (4) reduce the adverse effects on air quality of burning wood residues, and I would add (5) to reduce our economic inflation rate by reducing our dependence on foreign oil.

Congressman Weaver has a bill, H R 11293, in the works of Congress which calls for the production of alcohol from renewable resources, including wood waste, to be used as home heating or motor vehicle fuel. This bill, when passed, will require the production of more than one billion gallons of alcohol by 1981 and more than ten billion gallons by 1990. There is no way that this amount of alcohol can be produced from grain, it would cost too much and we do not have that much grain. But we can produce it from wood, logging, agricultural and municipal wastes.

For instance, acknowledging that all of the slash is not recoverable, but just say that it were, the estimated figures for gallons produced from the Willamette National Forest would look like this:

Digitized by Google

Reaction Products, Inc.
(503) 746-8821

P.O. Box 311
Springfield, Oregon 97477

Page two

I am told that about 8000 acres are logged each year, and using the figure 100 tons slash per acre recovered, the equation would be 8000 times 100 equals 800,000 ton of wood waste. Assuming 40% moisture content equals 480,000 dry tons, further assuming 70% cellulose content equals 336,000 tons of cellulose. Figuring an ethanol yield of 140 gallons per ton of cellulose, the slash from the Willamette Forest could be expected to yield slightly more than 47 million gallons per year.

Just as I can not tell you the cost of making an apple pie without knowing the cost of apples, I can not tell you the cost of this ethanol without knowing the cost of cellulose.

The cost of producing ethanol is estimated to be 29 cents per gallon, where the cost of waste cellulose feedstock is zero dollars per ton.

It is my understanding that the Forest Service is, or will be, paying $175 to $300 per acre to remove the slash. If that amount is enough to cover the costs of removal, the feedstock cost is then zero dollars/ton.

A more realistic approach would be to combine the Forest Service payment with payment, from alcohol producing entities, of $3.50 per ton of slash, chipped and hauled to the plant site. Ethanol produced from such wood waste, at that price, can be produced for 35 cents per gallon.

I beleive that it is necessary to stay roughly in that range because the only people who could seriously challenge the use of alcohol as motor vehicle fuel would be those in the petroleum industry. The refinery price of gasoline is reported to be 45 cents per gallon. Ethanol has a btu content 90% that of gasoline. Alcohol produced for 35 cents per gallon and sold for 40 cents per gallon is then superior to gasoline in nearly every way, including price. O

We still need to ascertain the cost of cellulose feedstock. This bill should provide that slash data.

Questions?

Digitized by Google

Wheelabrator
CleanFuel Corporation
2300 Liberty Street
P. O. Box 547
Albany, Oregon 97321

TESTIMONY PRESENTED BY
DAVID R. HART
GENERAL MANAGER
BIOMASS LIQUEFACTION EXPERIMENTAL FACILITY

Mr. Chairman and Members of the Subcommittee, my name is David R. Hart. I represent the Wheelabrator Clean-Fuel Corporation (WCC), which is a wholly owned subsidiary of Wheelabrator-Frye, Incorporated (WFI).

Wheelabrator-Frye is a publicly owned corporation, incorporated in the State of Delaware, with stock traded on the New York Stock Exchange. WFI is a recognized world leader in the design, construction and operation of environmental and energy systems. As a company, we are dedicated to the development of energy sources other than oil and natural gas and to the preservation of environmental quality.

On July 1st of this year, the Department of Energy selected WCC to be the operating contractor of the Biomass Liquefaction Experimental Facility at Albany, Oregon. WCC has selected me to be the General Manager of the Albany Facility.

Digitized by Google

In a series of experiments begun about ten years ago, scientists at the Pittsburgh Energy Research Center (PERC) of the Bureau of Mines discovered that a wide variety of waste materials could be converted into oil-like products by reaction with carbon monoxide under conditions of high pressure and moderate temperature and in the presence of an aqueous alkaline catalyst. The waste materials investigated included wood wastes, municipal refuse, corn cobs, waste paper and bovine manure. The oil-like materials produced were heavy viscous products, closely resembling No. 6 fuel oil and having a heating value of about 83% of that of No. 6.

The economic feasibility of the PERC process was assessed in 1972, and the facility presently installed at Albany was designed by The Rust Engineering Company, another subsidiary of Wheelabrator-Frye, Incorporated, in 1973-74. Construction of the facility was completed at the end of 1976.

The Albany facility was designed to show that the results obtained in the PERC laboratories could be reproduced in equipment which was of a much larger scale and which was capable of operating continuously. As an indication of the scale change involved, most of the laboratory experiments were carried out in a one-pint autoclave while the reactor at the Albany facility has a volume of over 100 gallons!

Other objectives of the Albany installation were to provide technical data which would permit the design of larger scale facilities, and to provide economic data which would permit evaluation of the justification of such facilities.

Digitized by Google

Possibly it is not widely recognized that the Albany facility is a research and development installation, but such is the case. The unit has a rated capacity of three tons per day. In an attempt to minimize the number of process variables which must be taken into account, only Douglas Fir wood chips have been used as a feedstock in the experiments made to date. However, based on the results obtained in the Bureau of Mines experiments, a commercial sized facility would be expected to use other less valuable raw materials. Because the facility is the first of its kind, it has experienced all the problems which are typically associated with, and expected of, such installations. Furthermore, permanent solutions for all the problems encountered have still not been developed.

Because WCC has only been the operating contractor of the Albany facility for a short time, and because the unit has suffered from a series of mechanical problems, I feel I must place some bounds on my statements, particularly those dealing with projected sizes of commercial facilities and projected product costs.

In general, I would say that our feeling about the Albany installation is one of enthusiasm. This enthusiasm is based on a number of considerations.

1. We believe the chemistry of the process is sound because we studied it during the time in which we were designing the plant.

Digitized by Google

2. The most recent experiments performed by the previous contractor closely followed conditions outlined in our proposal to D.O.E., and these experiments were considered successful.
3. The oil produced in the liquefaction process has a low sulfur content, so it would be an environmentally acceptable fuel.
4. The starting materials used in the process represent a renewable resource. For example, in a 1976 study, Battelle's Pacific Northwest Laboratories estimated that, in the area of northwest Oregon north of Douglas County, 1,000,000 tons of municipal refuse, 750,000 tons of forest products industry refuse and 700,000 tons of grass seed straw are produced each year. Liquefaction of these materials might produce as much as 2 - 2.5 million barrels of oil each year. (Viewed in another light, these same materials would be a renewable environmental problem.)

Based on his experience at the Albany facility, the previous operating contractor developed a preliminary conceptual design of a commercial Biomass Liquefaction Facility, and he estimated both capital and operating costs of such a facility as a function of plant capacity and price of feedstock.

Digitized by Google

This study developed a number of pertinent considerations.

1. It would appear that only liquefaction plants with capacities greater than 1000 tons per day will be economically attractive. However, the larger the plant, the lower the unit cost of oil produced.
2. Standardizing on a plant with a capacity of 1000 ton per day, and using a price one would expect to pay for the highest quality wood chips, the breakeven production cost was calculated to be just under $35 per barrel. However, if the wood was assigned no value, the breakeven production cost would be about $24 per barrel.
3. Process improvements realized from a continuation of the operation of the Albany facility for another 2 1/2 years were expected to reduce the projected product price to about $25 per barrel.
4. A pilot plant, having all the facilities envisioned for a commercial plant but of smaller size, was envisioned for commissioning after completion of the Albany development program, and the information gained by the operation of this plant was expected to reduce product cost to $20 per barrel. A five-year development program was envisioned for the pilot plant.

Digitized by Google

5. Finally, the design and construction of a 1000 - 3000 ton per day demonstration plant, utilizing full-size process trains, was expected to provide the means to be commercially competitive by approximately 1990. That is, it was expected that, by 1990, crude oil could be produced at a cost of about $14 per barrel.

Let me say again that all these numbers are projections by the previous operating contractor based on his experience at the Albany facility. We at Wheelabrator CleanFuel Corporation did not participate in formulating those projections. At this point in time, we have not prepared any projections of our own.

Mr. Chairman, I want to again thank you for this opportunity to appear before this Subcommittee. Wheelabrator-Frye endorses the efforts made by your Committee to place greater emphasis upon the biomass to energy program as a means by which this Nation might fully develop more of its potential energy resources. We believe that our project in Albany will go far toward demonstrating that clean energy can be produced from a waste residue while, at the same time, our environment can be cleaned up and enhanced in quality.

Digitized by Google

A Statement Concerning Forest Waste Utilization

by a Rural Labor Intensive Cooperative

MCRCO, Inc. (also known as "The McKenzie River Cooperative") is a rural work cooperative whose purpose is to provide economic sustenance to its members through labor intensive work which will benefit our community. We desire to work in ways that will support the natural life systems around us while working in harmony with nature.

Our work thus far has included: gathering firewood and pokes from slash and pum piles, clearing firelines and cleaning creek in logged units, some brushing and site preparation,and recently we purchased and completed a small salvage sale where milling the lumber on site was required. This experience has demonstrated to us that our concerns about slash u zation and creating an economic basis from forest re idues can be feasible and profitable to a rural-diversified economy and labor intensive work force. This salvage sale at French Pete was advertised as approximately 6 000 board feet of standing dead Douglas fir. We fell and milled this timber with a mobile dimension saw mill and an Alaskan Chainsaw mill. We rea zed over 6 000 board feet of milled lumber and 12 cords of firewood. This job took six days with a nine person crew. The projected return should be in excess of $3,000.00.

Thus it seems that any effort we make to re-use or recycle forest "by-products" or "waste-products" will help us save resources and energy in the years ahead. We feel that this effort will help slow the declining log inventory as well as provide employment for some of those who have lost jobs through mechanization and mill closures.

Since the members of the McKenzie River Cooperative make this area our home, we are committed to this area's preservation, and we desire to utilize its resources to make our living. We're completely open to exploring different labor intensive approaches to the question of forest management and we desire to work in conjunction with both the private loggers and the forestry services.

Therefore our primary objective is to develop into an economically self-sustaining labor intensive work force which can provide contractual labor for the Forest Service, private loggers and private citizens.

Digitized by Google

PROPOSAL TO FACILITATE THE ECONOMIC DIVERSIFICATION OF THE FOREST INDUSTRY IN THE UPPER McKENZIE VALLEY

Location: The Upper McKenzie Valley

Sponsor: MCRCO, Inc. (The McKenzie River Cooperative)
Post Office Box 124
Blue River, Oregon 97413

Letters Supporting Grant Proposal:

AGENCY	INDIVIDUALS
1. Congressman Jim Weaver	Mr. Jim Weaver
2. Commissioner Jerry Rust	Mr. Jerry Rust
3. Willamette Forest Supervisor	Mr. John Alcock
4. State of Oregon Forestry Dept.	Mr. Doug Coyle
5. Lane County Forester	Mr. Virgil Clark
6. State Dept. of Forestry	Mr. E. Douglas Cruikshank
7. McKenzie Bridge Ranger District	Mr. Len Farr
8. Blue River Ranger District	Mr. Bob Burns
9. Lane County Economic Development Council	Mr. William Wooten
10. Lane County Office of Appropriate Technology	Mr. Sam Sadler
11. Lane County Dept. of Housing & Community Development	Mr. Bob Wynia
12. Lane County Housing & Energy Program	Mr. Sabin Lamson
13. McKenzie River Gathering	Mr. Peter Jensen

Description:

The McKenzie River Cooperative has approximately 25 members. We are an incorporated labor-intensive cooperative. Our administrative structure is a counc l of representatives from each crew, a President, Secretary and Treasurer. We have been working together for the past nine months.

Our goals are:

I. To develop the means to utilize to a fuller extent the slash and hardwoods in our forests, including the recovery and use of
   a. Cedar, for posts, rails, shakes and kindling.
   b. Douglas Fir, for poles, dimensional lumber and firewood.
   c. Hardwoods, for dimensional lumber and firewood.

The utilization of "forest residues" into usable and economically self-sustaining product cannot be overemphasized from two important perspectives:

1. That rural communities are experiencing a growing under and unemployment problem as the logging industry becomes more mechanized and as the industry moves away from rural communities.
2. That the presen practice of burning logged over units contributes to the problem of air pollution - which the DEQ is becoming more concerned about.

33-770 O - 78 - 14

Digitized by Google

II. To expand the market potential of "forest by-products" through labor-intensive, small scale, low technological techniques which are widely available within rural communities.

III. To help stabilize employment in the McKenzie River Valley and to help develop a model for other rural forest communities from which to diversify and stabilize their forest economy.

IV. To develop a work cooperative which employs the principles of cooperation and the democratic structure as its foundation.

Benefits Expected:

The benefits will include:

I. To help stabilize and diversify the employment potential of the residents of the McKenzie River Valley.

II. To expand the uses and markets of forest "by-products" to facilitate greater utilization in terms of:

a) the energy use and consumption of both the regeneration time of new forests and the logging applications to extract forest resources,
b) to utilize different types of wood in their most effective and indigenously useful ways which can best serve local rural diversified economies (i.e., from firewood to mil ing dimensional lumber),
c) to create a source and supply of raw materials for local craftsmen - thus strengthening the economy of our area.

III. To generate more local, state and federal revenue through greater stabilized employment and similarly lowering the need for public assistance in our community.

IV. To reduce the amount of slash and hardwood presently left to rot and/or burnt and consequently, stimulating the creative uses of forest residues. Also as more of this resource is utilized the less the DEQ will concern itself with air pollution resulting from burning logged over units.

Assistance Needed:

We need approximately $30,000.00 to help us buy and build the machinery we need to help stabilize our employment while making our work more cost effective. We need to develop the following tools:

1. A portable winch - for yarding materials out of units or for pulling apart Pum or Yum piles. We would use a small BU-15 or 20 winch mounted on a trailer (approximate cost - $2,500.00).

2. A wood splitter to make the splitting of firewood more efficient and consequently making our firewood program more cost effective (approximate cost - $1,000.00).

3. A tanker truck - to allow us to work in the woods during fire season and also to enable us to have a standby, self-contained fire suppression crew in our area (approximate cost - $3,000.00).

Digitized by Google

4. A portable saw mill - to increase our production of dimensional lumber (approximate cost - $8,000.00).

5. A wood dry kiln - this would give us the means to take wood from its raw green form and transform it into dimensional kiln-dried lumber - particularly hardwood (approximate cost - $15,000.00).

Technical Assistance Needed:

1. We need to expand our knowledge of different wood species and how they might best be utilized.
2. To learn about different drying techniques relating to different wood types and how to get the best possible quality.
3. To expand our knowledge of yarding applications and techniques to get the greatest production out of small scale technology.
4. To learn the fundamentals of grading and scaling lumber.

Thus far we have been endorsed as an associate measure by the Upper Willamette Resource Conservation and Development District. I will continue gathering support and assistance for this proposal until funding is implemented. Then the real work will begin.

Digitized by Google

PRESENT TRENDS

The feasibility study that the Economic Research Associates recently completed shows the need for diverse locally controlled businesses that will remain responsive to the resources and needs of the loca areas. It seems apparent that the tradi iona forms of the lumber industry are going through a transitory period. Greater mechanization and the arger conglomerants are forcing the small mills to shut down; a trend which we've watched in Lane Count since the 970 s. Now we're faced with a sign ficant rise in unemployment and/or underemployment in our rural areas It is in these areas in which the lumber economy is based. It seems that we must attempt to change this present trend so that ultimately we can support the lumber industry, realistically. This seems imperative from two important perspectives:

A. That a healthy lumber economy is contingent upon a health rural labor force that supplies the wood.

B. That the Forest Management practices support the concept and practice of "sustained yield" in which the resources of our forests are protected and conserved for future generations.

In studying the Oakridge/Westfir Feasibility Study, I was very interested in the reasons and effects that they enumerated concerning the Declining Small Forest-Related Businesses. These reasons included:

A. Decline of forest resources and consequent time required for regrowth.

B. The current constraints imposed on loggers concerning their allowable cut (sustained yield).

C. The inability of small companies to compete with the larger conglomerates in terms of the necessary equipment and/or capital to bid on Forest Service contracts.

D. There seems to be little investment and/or committment towards more complete utilization of the slash and hardwoods. It seems that most operations are concerned almost exclusively with Douglas Fir.

E. Greater numbers of job losses due to greater mechanization.

Effects of Declining Small Forest Industry

A. Fewer "small Independent loggers and mills" competing against the larger companies.

B. Control of the loggers and mills in the lands of the larger conglomerates who's first loyalty is to profits. Their actions show that their decisions about productivity are made to maximize their profits, with little concern about the local area in regard to its local economics or ecology.

Digitized by Google

C. Greater unemployment or underemployment resulting from shut-downs and/or lay-offs.

D. Workers having to relocate to find suitable work, regardless of their age and/or time they've lived in a particular community. This could also promote rural to urban movement.

E. Workers having to settle for temporary or part-time work.

F. Workers being forced to retire early.

G. Increase in public assistance cases.

The reasons and effects are becoming all too apparent to us as mill shutdowns continue to levy a toll upon rural economies. The solutions that Economic Research Associates have put forth are not new. Cooperative efforts have come and gone many times for many reasons. This is a new situation where the hope of a cooperative effort should help change the present trend toward rural economic disparity. We are committed to this effort as we believe it can have the most positive and lasting effects upon the problems we collectively face.

Digitized by Google

OBJECTIVES OF GRANT PROPOSAL

Primary Objectives

A) Our primary objective is to develop into an economically self-sustaining, labor intensive work force which can provide contractual labor for the Forest Service, private loggers and private citizens. Once solidly established, this cooperative would provide greater employment possibilities for many residents of this area who are currently unemployed and/or underemployed

Key Objectives

A) To promote and encourage employment through creative alternatives to the problems of current forest management practices.

1) through the development of locally based, economically interrelated industries which would concentrate on utilization of forest residues presently considered "waste". Recovery and ut lization of:
   a) Cedar for posts, rails, shakes and kindling,
   b) Douglas Fir for poles, dimensional lumber (milled on location with portable saw mills) and firewood,
   c) Hardwoods for dimensional lumber to be dried and developed into finished handicrafts by local craftspersons with the excess to be processed into firewood.

2) to develop a labor-intensive work force to facilitate work for loggers, forest service and private citizens such as:
   a) Creek cleaning and piling slash after logging shows,
   b) Building firelines around units to be burned until this practice is altered to the total utilization of all forest residues,
   c) Firefighting with an experienced stand-by crew,
   d) Trail building and/or trail maintenance,
   e) Tree planting and thinning (i.e., T.S.I. or pre-commercial thinning),
   f) Roadwide brushing and/or conifer release programs through labor intensive hand labor. We feel that until herbicides are proven safe beyond a shadow of a doubt, that manual methods should be employed. Presently our cooperative owns a commercial chipper.
   g) We are also interested in facilitating the planning and implementation of community-based service projects.
      (i) helping seniors with weatherization and home repair projects.
      (ii) helping to plan and build the Blue River Park with materials (i.e., poles, hand split shakes and lumber milled on sight) using local youth to provide a part of the labor force as an educational and financia experience faci itated through CETA Summer Recreation Program. These projects are designed to develop skills and experiences fostering creative us of "waste" products, while developing a greater and direct sense of community pride and responsibility for our area.

Digitized by Google

B) To expand the market potential of forest "by-products" through labor intensive, small scale, low technological means resulting in diversifying and strengthening the economic interrelationships of this rural forest based economy. Creating a local supply of raw materials for local businesses.

1) through the gathering, milling and drying of hardwoods which will be developed into finished marketable products (i.e., toys, furniture, etc.).

C) To develop a work cooperative which employs the principles of cooperation and "democratic practice" as its foundation.

All of these potential uses of forest residues must be understood in light of the concept of sustained yield and that if we continue to use just the "cream", that soon it will be gone. It seems that if we strive to utilize everything, it will result in less need to cut as many trees which would give the whole forest cycle more time to replenish and regenerate itself. We feel we must learn to see past our immediate economics and judge our exploits in the light of future generations and what results our present policies will impose on them.

"The resources of the earth do not belong to this generation alone; we received them in trust from the past and we hold them in trust for the future."

What Ever Happened to this American Dream?

Digitized by Google

August 18, 1978

Dave Burwell
Leaburg, Oregon 97401

Jim Weaver Congressman
4th District, Oregon
Federal Building
211 East 7th Ave.
Eugene, Oregon 97401

Dear Jim,

I suspect the schedule for your hearing on HR 13324 in Eugene on August 29 is already filled, therefore I submit the following statement and request it be included in the record:

Research, pilot experiments and commercially operating plants have adequately proven that there are an untold number of useful products which can be produced from forest slash. Bohemia's plant in Coburg is marketing a few of dozens of products which can be made just from the bark of Douglas Fir Qu te obv ous y, any of our pulp p ants can use wood fiber in the manufacture of thousands of valuable paper products. During WWII, alcohol was made from wood waste at a plant in Springfield. I am told there is a pilot plant being built to make oil from waste wood. Charcoal has been made for hundreds of years, presto logs for decades, and now we have wood pellets.

All of the above porudcts are currently made of wood wastes obtained from mill sites at extremely low transportation costs. Even so, there are periodic surpluses in hog fuel and pulp chips while many remote mills are still burning and/or burying wood waste. Also, for several years the Forest Service has been subsidizing Piling of Unmerchantable Material (PUM) on clearcut units at a cost of $200 to over $1,000 per acre. Minor portions of accessible piles are used by locals for fuel wood but most of them are burned. The average haul of 50 miles for forest slash obv ously means that all the nearby grass straw of the valley and all the combustible wastes will be used for energy before we can use forest slash for energy. Even then, old growth slash will have to be burned in order to remove all the bark, tops, limbs, needles, splinters, and chuncks before planting is feasible. You should also realize that even if it became economically feasible to remove this slash without burning, this would deprive our forest soils of the slash nutrients which are released by burning and this would require that we supplement such cleaned forest soils with expensive chemical fertilizers.

It is my contention that the only potential for increased use of forest slash is by increasing demands or developing new markets. Traditionally, government has been ineffective in these areas while private enterpirse in constantly on the lookout for another way to increase their sales.

I, therefore, request that you refrain from using tax dollars to "demonstrate existing technologies" in a field where the government has adequately demonstrated a conspicuous lack of ability.

Sincerely,

Dave Burwell

Dave Burwell

Digitized by Google

BOHEMIA INC.

MAILING ADDRESS P.O. BOX 1819 • 2280 OAKMONT WAY EUGENE, OREGON 97401
TELEPHONE (503) 342-6262 TELEX 364-442

September 5, 1978

Rep. James Weaver
1723 Longworth
House Office Bldg.
Washington, D.C. 20515

Dear Congressman Weaver:

I'm very sorry I was not able to testify at your slash utilization hearings as you had asked through Mr. Peter Sage. I'm having to work through a difficult family situation which required me to be in San Diego over the time of your hearings. I hope, however, you will include the following comments into your records.

There are a great variety of products currently made from what most of us consider wood waste. Most of these products are manufactured from sawdust, chips shavings, and bark which are by--products of the major processing plants; the sawmills and plywood plants Currently there is a near balance between the residues produced by the mills and the raw material requirements of the secondary plants which manufacture paper, presto-logs, particle-board, etc.

From time to time something happens to the demand for mill residues. Most recently the pulp and paper mills experienced a labor strike. Immediately many companies lose their chip outlets, are forced to stockpile chips, and may be forced to close down their plants.

At other times, the demand for mill residue may increase for instance as a result of increased buying by the Japanese. This increased demand results in chip price increases which has a ripple effect all the way down to what happens in the woods. The higher prices and increased demand result in lower grade logs being brought out of the woods.

In simple terms, the amount and quality of wood fiber left in the woods following logging is in direct response to demand. This is a classic example of the supply and demand principle upon which our whole economic system is built.

The point of all this is that to spend taxpayer's money to remove additional and lower quality wood fiber from the woods is simply an exercise in spending taxpayer's money We already know that it is technically possible to remove this material, and we could easilly grind up this wood at Roseburg Lumber s idle whole-log chipper at Goshen, but what do we do with the low grade chips etc. that will result?

My suggestion is that if you wish to improve utilization from the woods, you should work to improve the demand for this material. Finance research into possible new products including fuels; develop a new clean hog-fuel electric generator, subsidize exporters to make chips more competitive on the world market, etc., etc.

Again, I am sorry I could not attend your hearings. My suggestions are quite simple and I hope you will take them seriously.

Sincerely,

BOHEMIA INC.

Thomas A. Lawler

Thomas A. Lawler
Forester

Digitized by Google

Statement of Kenneth L. Starry, Coquille, Oreg.

I will try to relate to you my concern about the mis-management of our public forests with as objective an outlook as I can presently muster under the indignation that I feel about the huge wastes involved. I know not upon whose head to heap the blame for this, so I will not even try to do so. In my opion however, if most of this timber is of little or no commercial value, as lumber or plywood, that it still could be used for paperand related products, or at the very least it could be used as firewood. As firewood it would cut back on the use of electrical power for heating in homes that are equiped with the means to take advantage of this. This could be considered to be a twofold conservation effort as it would use the wood to some good, rather than just being burned to clean the landings for future use, and it would help to conserve our meager supply of electrical power in the northwest. If this waste of one of our most valuable natural resourses is allowad to continue unchecked for a few more years it will have an adverse effect on our economy. The price of timber and related products increase every day, and what costs 2 or 3 thousand dollars today may well cost twice that next year. Yet these logs in the pictures that I submit to you for your inspections will be slashed burned as soon as the fall rains come if nothing can be done before that time arives.

The pictures are numbered on the backs in the order that I will mention them.

The two landings that I,m going to describe are located two miles northwest of the Moon Creek Road, on the North-Fork Ridge Road. This is located in Tioga Area in the game management regulations.

During my vacation, July 5-17 of this year, I and my family were in this area looking for wood. I had learned that the logging operation that at that time was working on and near the paved road called North-Fork Ridge Road, Sometimes gave scrap wood to people for firewood. I aproached the owner of this outfit, Whom I know not, and asked for permission to cut some of the wood along the road where they were working. He declined to give me permission for safety reasons, but indicated that I could have any of the wood on the other, older, landings that I wanted to take. However, He said; " Do not take the two large cedar logs laying by the first landing, because I'm going to take them. After thanking him for his generosity, we proceeded to the first of four landings that had been opened to us. Upon arriving at the first landing, my wife and I were amazed at the quanity and quality of the

Digitized by Google

logs that were decked there. It was a wood cutters dream. There were two large maple logs, several myrtles of large size, and many fir and cedar logs as well. One fir log was at least four feet on the large end if not bigger, and upwards of forty feet in length. The core of this log was rotten so the commercial value was nil, but there was at least three cords of excelent firewood in it. Thinking that it was a mistake we declined to cut on the better logs but had no trouble at all of cutting our wood for at least the first three months of the winter right there. After cutting for two and one-half days, my power saw broke down. We loaded what we had and prepared to go back to town to get the saw fixed, as we did so a large D-8 Cat came down the road and started to push the wood off the first landing. We watched in horror as he pushed unknown quantities of wood into the ravine bottem. I questioned the flagman for the machine about what, and why, were they doing this terrible thing. He replied that it wasn't his idea, he was only following instructions. They were told to clean the landings off and get them ready to slash burn AS PER GOVERNMENT ORDERS! This is the most wasteful of all the dumb laws that have ever been passed and I call upon YOU, as my Rep. in the law makers of this state to do what ever is in your power to stop this collosal wrong. They even pushed the two cedars that the owner wanted over the edge. I estimate their collective worth at $2000, or more at the current value of 260.00 per cord of bolts.

In pict. # 2 I stood on the top of the landing and shot the picture down the largest spill-way that I will call spill # 1. Many of the logs that are visible in the picture have considerable commercial value. These should be salvaged if possible. (And why wouldn't it be possible?) Picture #3 was taken across spill #2 to the center of spill #1. This is an after thought of spill #1's graphic illustration, but it still is nearly enough by itself to make a man cry at the waste.

In picture #4 is landing #2. Just under the landing, (now) there is about 10 saleable logs. They are not really visible in the picture, but I assure you that they are in reality there. I was ill the day I took these pictures so they do not really do justice in numbers to the problem that I was witness to, for this I apologise. I also regret my inability to attend the hearings on the 27th of this Mo. I have to work or I would be there. My boss is on leave, and as I'm next in line I have to be here. I hope this is some aid to you in the struggle that you have begun. Please feel free to call me if you need to know anything more of this matter.

O

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

DEPOSIT
NOV 09 1978
SHIPPED

Digitized by Google

Digitized by Google

Digitized by Google

Stanford University Libraries
3 6105 021 054 189

DATE DUE			

STANFORD UNIVERSITY LIBRARIES
STANFORD, CALIFORNIA 94305-6004

Digitized by Google

Digitized by Google